No. 4270.53
v.2

THE TRUSTEES OF THE PUBLIC LIBRARY OF THE CITY OF BOSTON
1852 1878

GIVEN BY
G.L. Cabot

PUBLIC LIBRARY OF THE

34th Congress, 1st *Session.* | SENATE. | Ex. Doc. No. 108.

REPORT

ON THE

UNITED STATES AND MEXICAN BOUNDARY SURVEY,

*4271.53
Vol. 2

MADE UNDER

THE DIRECTION OF THE SECRETARY OF THE INTERIOR,

BY

WILLIAM H. EMORY.

MAJOR FIRST CAVALRY AND UNITED STATES COMMISSIONER.

VOLUME II.

3181

WASHINGTON:
A. O. P. NICHOLSON, PRINTER.
1859.

366.044

G. L. Cabot

June 30, 1885

IN THE SENATE OF THE UNITED STATES.—JUNE 4, 1858.

Resolved, That the resolution of the Senate of the 15th of August, 1856, which directs the printing of two thousand extra copies of the Appendix to the Report of Major Emory on the Mexican Boundary Survey, be so far modified as to authorize the printing of only one thousand extra copies of said Report.

Attest: ASBURY DICKINS, *Secretary.*

CONTENTS OF THE VOLUME.

PART I.

BOTANY OF THE BOUNDARY.

INTRODUCTION. . . . . By C. C. Parry, M. D.
GENERAL BOTANY. By John Torrey, M. D.
CACTACEÆ. . . . . By George Engelmann, M. D.

PART II.

ZOOLOGY OF THE BOUNDARY.

MAMMALS. . . . . By S. F. Baird.
BIRDS. . . . . By S. F. Baird.
REPTILES. . . . . By S. F. Baird.
FISHES. . . . . By C. Girard, M. D.

UNITED STATES AND MEXICAN BOUNDARY SURVEY. DEPARTMENT OF THE INTERIOR.

PART I.

BOTANY OF THE BOUNDARY.

INTRODUCTION. . . . . . . By C. C. Parry, M.D.
BOTANY. . . . . By John Torrey, M.D.
CACTACEÆ. . . . . By George Engelmann, M.D.

WASHINGTON:
1859.

REPORT

ON THE

UNITED STATES AND MEXICAN BOUNDARY SURVEY,

MADE UNDER

THE DIRECTION OF THE SECRETARY OF THE INTERIOR,

BY

WILLIAM H. EMORY,

MAJOR FIRST CAVALRY AND UNITED STATES COMMISSIONER.

WASHINGTON:
1858.

PART II.

CONTENTS OF PART II.

INTRODUCTORY CHAPTER ON GEOGRAPHICAL DISTRIBUTION AND BOTANICAL FEATURES.

REPORT ON BOTANY.

REPORT ON CACTACEÆ.

INTRODUCTION.

INTRODUCTION.

BY C. C. PARRY, M. D.

GEOGRAPHICAL DISTRIBUTION.

Every observing traveller must have noticed how closely the peculiarities of the scenery of a country depend upon its vegetable productions. Not only is this true of trees and the larger forms of plants, but even the humbler, though apparently insignificant in themselves, have their share in producing the general effect. Hence the subject of the geographical distribution of plants is one which may command the attention of every intelligent mind, and this department of botany has for many an interest which the higher details of the science do not possess.

Perhaps no region of equal extent presents more marked illustrations of the relation of the vegetation of a country to its topography and geology than those afforded by that lying along the Mexican boundary line.

The usually difficult task of constructing a phytological map might here be performed with comparative ease, as the observer, little perplexed by a great variety or gradual blending of forms, involuntarily associates particular localities with the predominating and characteristic vegetable productions. Thus one who has ever traversed the desert table lands of the Upper Rio Grande will not fail to unite in his recollection of these tracts the dull foliage of the Creosote bush, the long thorny wands of the *Fouquieria*, the palm-like *Yucca*, and the crimson-flowered and spine-armed *Cereus*. Still less can any one, who has seen the giant cactus of the Gila in its perfection, ever forget the wild and singular features of the country in which it grows. The distinctness with which the botanical districts are defined gives an unpleasant sameness to the scenery of this country. The extensive plains exhibit a monotonous succession of the same forms, and each mountain slope and ravine presents us a collection of plants quite like those we have so often seen in other and similar localities. Indeed, the botanist in these regions, knowing what to expect in each different situation, soon loses his zeal, and becomes intent upon little else than overcoming space.

We propose to give a rapid sketch of the features presented by the vegetation of the country, especially noticing those plants which predominate in, and give character to, the several districts into which we have divided it.

THE LOWER MARITIME BELT.

The flora of this strip of country is too well known to require an account here, had we the necessary data for describing its characteristic botanical productions. Its position being intermediate between the "tierra caliente" of Mexico and the gulf coast of Louisiana, gives to its vegetation a mixed character, partaking of that of the two extremes. Thus, while upon the lower portion of the Rio Grande, we have the sub-tropical character of its vegetation indicated by the presence of the arborescent palms of the "tierra caliente," we have at the same time the Texas live-oak, the type of a more northern flora. This region has been more thoroughly explored by A. F. Schott, esq., whose observations upon its botany and other natural features will be found in a separate memoir.

UPPER MARITIME BELT.

To the lower belt, which has an uniform alluvial soil, and is more or less influenced by its vicinity to salt water, succeeds rolling prairies, underlaid by cretaceous rocks, which now for the first time appear, though more or less hidden from view by a thick layer of erratic and alluvial deposits. This division includes, as we have already noticed, the most habitable parts of Texas, through which run the numerous rivers which empty into the Gulf of Mexico. Here we find rich cotton lands, and an abundance of trees, including species of oak, hickory, ash, elm, walnut, cypress, &c., with an exceedingly rich undergrowth of vines and shrubbery. The open prairies are densely covered with luxuriant grasses, and have a rich and varied flora, which has been well explored by the early labors of Drummond, and later by those of Linctheimer and Wright. Upon the southern portion of the Rio Grande, where there is a higher temperature, united with greater aridity of the soil, a vegetation of quite a different character appears; we have here the dense growth of "chapparral," which is so peculiar to this region. The plants which make up the thick mass of shrubbery known by this name are different species of *mimosa* and *acacia*, with the well known mezquit and other forms, most of which are armed with hooked thorns, and make up a jungle which is almost impenetrable.

The botany of this region is too well known, from various published accounts, to require further details in this place.

VEGETATION OF THE CRETACEOUS FORMATION.

As the geological formation becomes more exclusively cretaceous the vegetation assumes a peculiar character, and is made up of species which are rarely found elsewhere. The shrubbery of this region presents a continuous succession of the same forms, among which are *Berberis trifoliolata*, *Rhus microphylla*, *Porliera angustifolia*, *Diospyros Texana*, *Roeberlinia spinosa*, *Adolphia infesta*, *Microrhamnus ericoides*, and *Acanthoceltis*, a new genus of Engelmann, allied to *Celtis*. Along the margins of the usually dry water courses the dwarf walnut (*Juglans rupestris*) and *Fallugia paradoxa* are constantly found.

The perennial herbaceous plants of this district are numerous. The rocky ledges produce in their crevices various species of *Laphamia* and the scarlet flowered *Pentstemon Grahamii*, Several examples of the large tropical family of *Malpighiaceæ* are found here, among them *Galphimia linifolia*, *Aspicarpa hyssopifolia*, and *Janusia gracilis*. Cacti are numerous, and include among the forms here presented opuntias, mammillarias, and numerous species of cereus. The curious *Lycopodium dendrolobium* grows upon the perpendicular faces of the limestone rocks. This plant commonly called "rock rose," is remarkable for the hygrometric qualities of its fronds, which are usually rolled up so that the plant forms a dry ball, which expands under the influence of moisture, and then appears fresh and vigorous. Several new species of *Cheilanthes*, *Pteris*, *Notoclæna*, and other genera of ferns are found here.

Upon the rocky ledges a small species of agave grows in abundance. The low leaves, which are pointed with sharp spines, are very troublesome to the foot traveller; they are, however, of some use to the Mexicans, who employ the strong fibres they contain in making coarse ropes. The plant is known to the people of the country as "Lechaguia." The table lands and valleys are usually covered with an abundant growth of "grama grass," and among it are frequent clumps of *Dasylirium*, or "bear's grass."

We have here also several interesting species of *Nyctaginaceae*, belonging to the new genera, *Acleisanthes*, *Pentacrophis*, and *Selenocarpus*, lately proposed by Dr. Gray.

Among the annual plants of this district are several species of *Mentzelia*, *Perezia*, *Pectis*, *Hymenatherum*, &c., also the pretty *Eucnide lobata*, which usually grows in almost inaccessible situations upon the perpendicular faces of the limestone ledges.

There are so many species that seem to be equally abundant that it is difficult to designate any as being characteristic of the cretaceous district.

VEGETATION OF THE HIGHER BASIN PLAINS AND THE ADJOINING MOUNTAIN RIDGES.

The higher alluvial tracts, forming the basin plains before described, produce a number of northern forms of plants, such as species of *Œnothera*, *Gaura*, *Riddellia*, *Zinnia*, and *Polygala*. We also find here the curious *Peganum Mexicanum* and *Peteria scoparia*, the latter a pretty plant of the family *Leguminosæ*. The depressions in this alluvial region are covered with a coarse grass, which presents an uniform dead brown color throughout the greater part of the year. In the deep recesses and shaded valleys, the vegetation has a freshness unknown to that of the plains. In these localities we encounter the upland live oak (*Quercus Emoryi*, and the nut pine, (*Pinus edulis*,) and growing beneath these, *Vitis incisa*, *Clematis Pitcheri*, *Ungnadia speciosa*, &c. The constant presence of water in the larger valleys is marked by the growth of cotton wood and willows.

VEGETATION OF THE EL PASO BASIN AND THE UPPER RIO GRANDE VALLEY.

The vegetation of the immediate valley of the Rio Grande, and that of the country immediately adjoining it upon either side, are strikingly different, and whoever passes from the valley, and crosses the line of mountains which bounds it to the regions beyond, cannot but remark the difference in the landscape, due to the presence of new plants. Upon the table lands which spread out beyond the mountain barrier, the eye falls upon a great variety of plants, none of which are seen in the more fertile valley. Among these are *Fouquieria splendens*, *Larrea mexicana*, *Flourensia cernua*, *Rhus microphylla*, *Condalia obovata*, *Koeberlinia spinosa*, and species of *Krameria*, *Ephedra*, and *Yucca*. There the *Cacti* flourish in a congenial soil, and we find representatives of the genera *Opuntia*, *Echinocactus*, *Mammillaria* and *Cereus*.

Among the numerous herbaceous and suffruticose plants of these localities we may mention *Cevallia sinuata*, *Greggia camporum*, *Eriogonum Abertii*, and several species of *Dalea*; plants of the family *Compositae*, are especially abundant, and include among others *Baileya multiradiata*, *Bahia absinthifolia*, *Porophyllum scoparium*, *Psathyrotes scaposa*, *Hymenatherum acerosum*, *Townsendia strigosa*, *Calycoseris Wrightii*, *Stephanomeria minor* and *Rafinesquia Neo-mexicana*.

The natural order of *Nyctaginaceæ* is represented by *Selenocarpus chenopodioides*, *Boerhaavia Wrightii*, and others.

The principal grasses of this region consist of the kinds known as "bunch grass," and belong to the genera *Chondrosium* and *Bouteloua*. The margin of the table land, where it borders upon the valley is broken by deep ravines, and we find here upon the sandy blufls a growth of chaparral, made up principally of mezquit and the equally thorny acacias. In the dry pebbly water courses, the willow-leaved *Chilopsis linearis* frequently occurs. Many of the already mentioned plants of the table land are found here, besides others, which are peculiar to these localities, such as *Dithyrœ wislizenii*, *Abronia mellifera*, *Gilia longiflora*, *Lepidium alyssoides*, *Gaillardia pinnatifida*, *Palafoxia Hookeriana* and *Tetraclea Wrightii*, a singular genus of *Verbenaceae*, recently described by Dr. Gray. In the valley of the Rio Grande we frequently find a heavy growth of cotton wood and willows. The "screw bean," *Strombocarpa pubescens*, often occupies large tracts, accompanied by a dense undergrowth of *Baccharis salicina*. The low saline places produce an abundance of *Obione canescens*, while on the higher ground, *Tessaria borealis* is a common plant.

A number of coarse composite plants are found in the valley, such as *Texmenia encelioides*, *Coreopsis cardaminefolia* and *Aster spinosus*, the latter often forming dense matted masses of considerable extent.

The rocky crevices of the adjoining mountains furnish some of the most interesting plants of this region. We here find *Fendleria rupicola*, *Mortonia crassifolia*, *Glossopetalon spinescens*, *Agenia parvifolia*, *Bouvardia hirtella*, *Tecoma stans*, *Texmenia brevifolia*, &c.

The higher mountains of the Organ range have a vegetation possessing a somewhat alpine character, and bear a scattering growth of pines and oaks, beneath which flourish a number of shrubby and herbaceous plants, quite similar to those found upon the more lofty ranges further to the west.

VEGETATION OF THE SIERRA MADRE.

As we approach the base of the Sierra Madre, passing over the extensive basin-plain already described, a gradual increase in the elevation is marked by a disappearance of those plants, which were common lower down, and the presence of others wearing a more alpine aspect. The surface is less bare than upon the plain below, and is covered with a closely matted grass, which gives a singularly rounded outline to the undulating land around the base of the mountain. Along the lower rocky swells grows the beautiful *Carphochete Bigelovii*, with *Anemone Caroliniana*, *Streptanthus linearifolius*, *Pentstemon Torreyi* and *Fendleri* are among the characteristic plants of these localities. There are but few shrubby plants, several species of *Ephedra* being among the most conspicuous. The streams are bordered by *Fraxinus velutinus* and *Juglans rupestris*, (the large variety,) and in moist places an old Californian acquaintance, *Anemiopsis Californica* makes its appearance.

Upon the mountains oaks and pines are found, mostly *Quercus Emoryi* and *Pinus edulis*, though in certain localities there is larger timber, consisting of *Pinus Chihuahuana* and *Abies Douglasii*. The smaller woody growth here includes several species belonging to the Californian mountain flora, such as *Cercocarpus parvifolius* and *Arctostaphylos tomentosus*.

Upon the summit of Ben More, further to the north, Dr. Bigelow discovered many plants indicative of an alpine flora, among these were *Frasera speciosa*, *Rubus Neo-mexicanus*, *Actinella Richardsonii*, and, perhaps, most remarkable of all, a small fern, *Asplenium septentrionale*, an European species not before detected on this continent.

The abrupt descent through Guadaloupe pass, upon the western slope of the ridge, presents a profusion of evergreen shrubs and flowering plants, including most of those which occur on the summit ridge. Live oaks grow upon the rocky sides of the ravines, and with them is frequently associated a species of cedar. Among the more interesting of the herbaceous plants found here, are *Dryopetalon runcinatum*, *Vesicariæ*, and *Colomiæ*. The narrow valley of the stream which runs through the bottom of the Pass is wooded with ash, cotton wood, and Mexican sycamore.

VEGETATION OF THE UPPER VALLEYS OF SAN BERNADINO, SAN PEDRO, AND SANTA CRUZ WITH THAT OF THE ADJOINING MOUNTAIN RANGES.

The country embraced in the above limits, includes that portion of Northern Sonora, which divides the waters which flow north towards the Gila river from those whose course is south, towards the Gulf of California. It is, as we have before stated, diversified with high wooded mountains and upland plains, well watered valleys and dry and barren tracts. The arborescent growth is not essentially different from that we have noticed in speaking of the other divisions of country. Live oaks, the nut pine, cedar, ash, walnut and cotton wood are produced either upon the mountains or in the upland valleys. Its plains are covered with an uniform growth of upland grama grass, or in the more arid localities by mezquit and its thorny associates. This region furnishes a number of singular and highly interesting genera and species, most of which are described by Dr. Gray, in the second part of "Plantae Wrightianæ," in the Smithsonian Contributions. A reference to this work will give a better idea of the character and distribution of the flora of this district than our limits will allow us. As it occupies a station between several botanical divisions, so its flora partakes of that of those regions. The following list of some of the plants found here will be seen to embrace species belonging to California, Texas, Mexico, and New Mexico, viz: *Eschscholtzia douglasii*, *Zauschneria Californica*, *Eulobus Californicus*, *Bowlesia tenera*, *Anemone Caroliniana*, *Draba caroliniana*, *Corydalis aurea*, *Androsace occidentalis*, *Rutosma texana*, *Erodium texanum*, *Layia Neo-mexicana*, *Cowania Mexicana*.

VEGETATION OF THE LOWER SANTA CRUZ VALLEY, THE DESERT OF TUCSON, AND THE CENTRAL VALLEY OF THE GILA.

The region defined as above constitutes a very distinct botanical district, many of its peculiar plants not being found elsewhere. As we have mentioned in a previous sketch, the valley of the Santa Cruz, as it leaves the mountains in its northward course towards the Gila, gradually looses its fertile character, and finally terminates in the desert plain which forms the table land of the Gila. The vegetation of this tract comprises many of the forms which are found on all the barren plains of the country. Here, as in similar situations elsewhere, the mezquit and the creosote bush are conspicuous. Cacti are abundant here, and of various types. There are the low arborescent *Opuntias*, generally bearing proliferous fruit, as well as several elliptical-stemmed species. The enormous *Echinocactus wislizenii* and *Caespitose mammillarius* and *Cerei* are common, while, either standing solitary or collected in groups, the lofty *Cereus giganteus* towers above all. A species of misletoe is common upon the mezquit trees of this region.

The sheltered crevices of the neighboring mountains produce a species of agave, and in these localities we find *Franseria deltoidea*, *Encelia farinosa*, and *Perityle nuda*.

After the occurrence of rains the open plans are carpeted by a profusion of bright colored evanescent annuals, among the most conspicuous of which are *Vesicaria*, *Eschscholtzia Douglasii*.

A scanty growth of annual grama grass grows beneath the ever abundant *Larrea*, and the more alluvial portions of the tract are occupied by *Obione canescens*. In the deep cracks of the smooth washed surface *Bowlesia tenera* and some species of *Hosackia* are found. Near the immediate valley of the Gila we encounter species of *Œnothera*, *Simsia*, *Gaillardia*, and *Oligomeris glaucescens*.

The valley of the Gila has many features in common with that of the Rio Grande, and among the botanical productions common to both valleys we notice *Tessaria borealis* and mezquite, which latter forms dense "chaparral." The trees bordering the stream are mostly cotton wood and willow.

VEGETATION OF THE RIO GRANDE, CAÑONS, AND THE CONNECTED BASINS.

The flora of the cañons of the Rio Grande differs but little from that of the mountain ravines we have already alluded to. We find stunted shrubs rooted in the crevices of the rocks or scattered along the broken summits. The abrupt walls, whether of limestone or of igneous rock, afford favorable places for the growth of such plants as affect inaccessible localities. Here we meet two species of the well characterized genus *Laphamia*, viz: *L. dissecta* and *L. bisetosa;* also *Perityle aglossa* and *L. Parryi*, the pretty *Eucnide lobata*, *Cowania ericifolia*, and *emoryi*, a new genus of the order *Scrophulariaceæ*, dedicated to Major Emory.

In open places the vegetation peculiar to table lands makes its appearance.

In the more extensive basin of Presidio del Norte the flora partakes of the character of that of Mexico, and more tropical forms prevail. We find here *Kallstroemia grandiflora*, *Martynia violacea*, *M. arenaria*, *Talinopsis frutescens*, *Nicolettia Edwardsii*, and several species of *Boerhaavia*. *Cereus Greggii* is quite common, and the delicious fruited *Cereus stramineus* grows in its greatest perfection.

All the basins and cañons within these limits present a similar vegetation to the one just noticed.

In the Chisos basin a remarkable shrubby plant, allied to *Scutellaria*, was discovered. This Dr. Torrey has described as *Salizaria*, a new genus of the order *Labiatæ*. It has a straggling habit, and grows along the gravelly margins of dry water courses. The Sierra Carmel, upon the summits of which we should expect to meet with many botanical novelties, was passed, in a necessarily hurried march, in the month of November. Under these circumstances but little information could be obtained respecting its flora. Live oaks and the nut pine grew upon the higher ridges, and its upland plains and valleys were covered with luxuriant grama grass. The beautiful Santa Rosa valley is marked by the most attractive scenery. Its broad and fertile plains, with copious streams, bordered by gigantic cypress, sycamore, and pecan trees, with a back ground of high mountains, form a landscape upon which the traveller, wearied by the monotony of the sterile table lands, gazes with the keenest enjoyment.

From this point, on approaching the lower course of the Rio Grande, lying to the southwest, there is a sudden transition to the forms of vegetation before alluded to as characterizing this arid and thorn beset district.

AGRICULTURAL CAPACITIES.

We have attempted to give a sketch of the external features and spontaneous vegetation of the region of country along the United States and Mexican boundary line. It now remains to notice its adaptation to agriculture, and our remarks regarding this may all be embraced in one general conclusion.

Wherever the supply of water is constant, and sufficient for the purposes of irrigation, or wherever the regular overflow of the rivers can be relied upon to supply the amount of moisture required for the growth of crops, independently of the rains, in those places, and in those only, can agriculture be pursued with success.

The portions of the country best suited to cultivation are those which are capable of irrigation. For these the supply of water is obtained, not only from the larger rivers, as the Rio Grande and Gila, in which the head of water is increased by the construction of dams, but springs and small water courses, these often lying in mountainous situations, are laid under tribute.

In the course of the preceding sketch we have noticed the fact that the lower portions of the numerous valleys are of a sterile and unproductive character, for the reason that the water of the streams is absorbed before it reaches the portions which lie farther below, where, instead of a running stream, we only find a sandy bed, with the adjoining region unfit for the purposes of cultivation.

Those places which are supplied with the necessary moisture by the overflow of the rivers have a still more precarious dependence than those where irrigation is practiced. In these the quantity of water cannot be regulated, and they are exposed to the two extremes of scarcity or superabundance. One of the best examples of this system of cultivation is seen at Presidio del Norte, where the Concho unites with the Rio Grande. As these two rivers have different periods of high water the inhabitants are enabled to frequently secure two crops from the same fields in one season. In order to accomplish this the first crop, depending upon the overflow of the Rio Grande, must be sown and harvested in time to admit of the planting of the second crop, depending upon the later rise of the Concho. All this depends upon so many contingent circumstances that it is oftener attended by disappointment than by success, and, between the extremes of flood and drought, the people frequently suffer for want of food.

We have already noticed that a large extent of country, though destitute of streams to supply the water required in cultivation, receives from the atmosphere and clouds, in the form of dew and rain, sufficient moisture to permit the growth of the richest pasturage, and we have large districts of unequalled grazing lands, so broad and so abounding in herbage as to compensate for their deficiencies in other respects. Here the buffalo and antelope have already given place to wild cattle and horses, and we look for the time when these shall yield in their turn to domesticated flocks and herds, denoting that nomadic barbarism has been supplanted by civilization, with its ameliorating influences.

Many large tracts of this country must ever remain as deserts, being alike destitute of vegetable and mineral resources; but even these otherwise valueless regions are the very portions which present the fewest impediments to travelling, and, indeed, form natural highways to otherwise inaccessible parts of the country.

Other facts connected with this part of the subject, as regards character of climate and general habitable condition of different sections of the country, will be dwelt on by others, or may be left to inference from what has been already noted.

BOTANICAL FEATURES.

The general botanical features of the region under examination next claim our attention, and in elucidating them, we shall be guided by the great natural divisions of country already indicated, as these furnish us plain lines of demarcation for separate botanical districts. Thus, there is a group of plants growing in the immediate vicinity of the sea, and which characterize the *Littoral Region;* above these, and confined more or less closely to the base of the mountains, is found another group indicating the *Supra-Littoral Region;* next to this, in the ascending order, is what may be termed the *Lower Mountain Region*, with a still different vegetation; and lastly, the *Proper Mountain Region*, producing plants peculiar to elevated localities.

LITTORAL PLANTS.

Among the exclusively littoral plants, some are common to the seacoast of nearly all countries; and these, such as the common *Salicornia*, are found here, and it is our intention to notice only those which are peculiar to this particular coast. We mention, first of all, two species of *Abronia*, (*A. arenaria* and *A. umbellata*,) which spread their trailing branches over the sand dunes which edge the sea-shore, and with their abundant foliage and beautiful umbelled flowers, give relief to the barren features of the landscape.

Growing with the *Abronias* a species of ice-plant (*Mesembryanthemum*) is frequently found. This has spreading succulent stems and triangular leaves. Its showy, though evanescent, pink flowers appear only in bright sun-light, and are succeeded by an edible, juicy fruit. In the same region, though less closely confined to the sea-beach, is another species of this genus, probably identical with the well known *M. crystallinum*. Here it is an annual, attaining its full size in the month of June, when it may be seen in large patches several rods in extent, presenting a thick bed of showy flowers. The leaves and stems are beset with shining glandular little warts, which contain a strongly saline fluid. The flowers, which are ephemeral and very abundant, appear in regular succession from June to August. After the flowering period the plant withers and dries up, leaving a thick mat of seed vessels, which remain closed until the commencement of the rainy season; the hygrometric tissue of the capsule then expands, under the influence of moisture, and the enclosed seeds escape and commence germinating. The dry remains of the plant are frequently burned for the sake of the ashes, which, being strongly alkaline, are used in making soap. Both the species here mentioned are so characteristic of the places they occupy that they would seem to be indigenous, but it is generally thought by botanists that they are introduced.

Among other plants characteristic of this region are *Œnothera viridescens*, (Hook.,) *Franseria bipinnatifida*, and a species of *Statice*, which grows near the head of San Diego bay, and seems hardly distinct from *S. Limonium*.

The common *Salicornia* here acquires a shrubby growth, and is frequently entwined with a species of *Dodder*, and accompanying it is found a new species of *Batis*, to which Dr. Torrey has given the name of *B. Californica*. *Frankenia grandifolia* grows here abundantly, associated with *Layia carnosa*, *Aromia tenuifolia*, and *Tuckermannia*. Among the shrubs peculiar to this region may be noticed *Styphonia serrata*, with its thick evergreen leaves and *Obione canescens*, which is very abundant. A species of *Lycium*, with yellow flowers and red berries, is also conspicuous. This brief enumeration will serve to give a general idea of the characteristic vegetation of what we have termed the Littoral Region.

SUPRA-LITTORAL REGION.

Leaving the salt water, to the influence of which the characteristics of the preceding region are due, we come to the Supra-Littoral district, which presents a more striking variety in its vegetable forms.

This region includes a large proportion of shrubbery, to which, as it imparts peculiar features to the scenery, we shall especially direct our attention.

Before enumerating the plants which make up this woody growth, we would remark, that nearly all the shrubs of this region are inclined to form a stunted and bushy growth, which is evidently caused by exposure to dry seasons and sea breezes. There is also to be noted a leaden color of foliage, which does not depend upon the abundant growth of *Artemisiæ*, most of which possess this tint, but is common to a large proportion of the shrubs of this region. Both of these peculiarities of the vegetation have their influence upon the character of the landscape.

One of the most striking shrubs is *Eriogonum fasciculatum*, a neat evergreen, with small pink flowers, disposed in crowded umbels at the summit of prolonged stalks. Its season of flowering is during the midsummer, and it is generally characteristic of arid and barren tracts. *Isomeris arborea* (Nutt.) is frequently associated with this plant, and is distinguished by its yellow flowers and singular bladder-shaped pods. Here is also found *Rhus aromatica*, (Nutt.,) which frequently acquires quite an arborescent growth and occupies extensive tracts. It is clothed with shining evergreen leaves, which resemble those of the holly and exhale a strong odor like that of laurel. We also meet with *Photinia arbutifolia*, a handsome and often symmetrically formed shrub. This has rich evergreen foliage and beautiful bunches of white flowers, which are succeeded by scarlet berries. In favorable localities this sometimes attains the height of twenty feet, with a trunk six inches in diameter at the base. Another shrub deserving especial notice is *Simmondsia californica*, (Nutt.,) which has persistent leaves of a pale green color, and inclined to assume a vertical position. The plant is dioecious; the mature fruit is about the size of a hazel nut, and has a thin smooth three-valved husk, which separates spontaneously when ripe, disclosing a brown triangular kernel. This fruit, though edible, can hardly be termed palatable; its taste is somewhat intermediate between that of the filbert and acorn. It is, however, employed by the Indians as an article of diet, and is called by them "jajoba." The range of the *Simmondsia* extends to the base of the mountains, and it is found again, in similar situations, upon the eastern side, though less abundantly, as well as in the upper valley of the Gila, where it was detected by Major Emory, in 1846. Besides the shrubs above enumerated, the *Artemisia Californica* is widely diffused over this region; this is employed by the Mexicans as a popular remedy against cholera, under the name of "*Estafiat.*"

On the San Diego promontory there is a dense and intricate growth of shrubbery, to which both the people from the town and from the shipping have for a long time resorted for fuel. The greater proportion is furnished by *Eriodictyon*, which is a large shrub of from eight to twelve feet in height, with a diameter of from two to four inches. The wood is very close-grained, but brittle, and is charged with a resinous matter, which causes it to burn readily, even when green. In this locality are also found the beautiful *Ceanothus rigidus*, *Pitavia dumosa*, *Adenostoma fasciculata*, and a species of scrub oak, all forming dense thickets.

We must not omit to mention the *Cactaceæ,* which here present species of all the extra tropical genera, as remarked by Dr. Engelmann in his memoir upon this family. These plants, from their striking and singular forms, impart a characteristic feature to the region they inhabit.

A new species of pine is peculiar to the district now under consideration. It occupies an arid tract near the ocean beach, about twelve miles north of San Diego, at the entrance to Solidad valley. In this locality (the only one in which it has been found) it forms a small sized tree, with rather open foliage. It is particularly distinguished by its long fascicles of leaves, which are in fives, and its large ponderous cones. This species, the specific characters of which will be found more fully described in the following list, I have ventured to designate, in compliment to a distinguished American botanist, as *Pinus Torreyana.*

Along the borders of the streams which traverse this Supra-Littoral district are found the common cotton-wood, (*Populus angustata,*) the *Platanus Mexicanus*, and, in the lower portion of the San Luis Rey valley, an *Alnus;* these, with various species of willow, make up the proper timber growth of this region. The undergrowth in these localities consists mainly of coarse representatives of the order *Compositæ*, conspicuous among which are several shrubby species of *Baccharis*. In moist places *Anemiopsis Californica* is frequently met with, and where the soil is rich the surface is covered by a rank growth of wild mustard (*Sinapis nigra*) and mallows, (*Malva obtusa.*)

The herbaceous and annual plants of this region are so numerous that we can only allude to a few of the more striking and characteristic.

It is in the latter part of winter and during the earlier spring months that California puts on her richest floral garb. Then the arid hills assume an aspect far different from their desert-like summer appearance. In February the moistened ground becomes arrayed in an assemblage of varied tints. The pale blossom of the elegant *Dodecatheon integrifolium* nod on every hill side, blue *Lupines* and rainbow colored *Gilias* deck the ground, and various ferns and mosses appear. The *Ribes speciosum* hangs its scarlet pendants, and the rich yellow flowers of *Viola pedunculata* are abundant everywhere. Even the numerous northern genus *Saxifraga* is represented here by more than one species. A large number of *Hydrophyllaceæ*, including species of *Nemophila*, *Phacelia*, and *Eutoca*, are among the early tokens of spring, while the orange colored flowers of *Escholtzia*, the pale blooms of *Platystemon*, and the pink ones of *Meconopsis*, show that the poppy family contribute largely to make up the vernal flora. Among the twiners are a species of *Clematis* that is either new or a variety of *C. pauciflora* and *Megarrhiza Californica* of Torrey; the latter plant, which hangs its prickly burs from almost every bush, is remarkable for the enormous size of its root. Further to the north the valleys are clothed with a luxuriant growth of wild oats, (*Avena fatua,*) which is so extensively naturalized that it gives to every fertile tract the appearance of a cultivated field. The wide plains that border the sea in the neighborhood of Los Angeles are covered with the richest pasturage. The *Erodium cicutarium*, (called here "pin grass," and furnishing a highly esteemed fodder,) with several species of wild clover, (*Trifolium* and *Medicago,*) are mingled with a variety of other herbage, and thus serve to give a meadow-like aspect to this teeming land. Such is the general appearance of the country from February to April, inclusive, and then is to be seen the glory of the Californian flora.

THE LOWER MOUNTAIN REGION.

As we begin to enter the mountain range we come upon what we have termed the *Lower Mountain Region*, the intervening slope between the base of the mountain and the summit ridge. Here the species of plants last considered disappear, and are replaced by an almost entirely different assemblage of vegetable forms.

The *Adenostoma fasciculata*, which we have before alluded to, is frequently found covering entire hills. This plant is not peculiar to this region, but grows on all exposed situations, from the lowest to the most elevated. It has fine and thickly set dark green foliage, and forms a conspicuous feature in the landscape. From its habit of growth it may be considered as the heath of this country, though it belongs to a different family, that of the *Rosaceæ*.

As the *Artemesias* disappear, scrub oaks show themselves on the steeper mountain slopes; and, as the valleys become narrower and more rocky, we find the California live-oak (*Quercus agrifolia.*) This forms a large spreading tree, the holly-like evergreen foliage of which adds to the beauty of the mountain scenery. In the more northern sections of the country this oak is met with in the vicinity of the sea; but as far south as San Diego it grows upon the mountain slopes only, and its presence denotes a considerable elevation. It is usually of stocky growth and unwieldy shape. Its wood is coarse grained and liable to speedy decay; hence it is but little esteemed for its timber. It has, however, a very thick bark, which will, no doubt, in time, be found of great value as a tanning material.

Among the shrubs of this region which deserve notice is *Arctostaphylos tomentosa*. This species is said to form quite a good sized tree at the north; but in the district at present under consideration it occurs only as a shrub, rarely attaining the height of fifteen feet and a diameter of from two to four inches at the base. It is a handsome evergreen bush, sending off numerous branches close to the ground. Its bark is smooth, of a reddish color, and splits off in transverse shreds. The wood, which is very close grained and durable, is an excellent material for small turning work. It bears a small red berry, resembling our well known "bear berry," though less astringent, which possesses acid properties, and, under the name of *Manzañita*, ("little apple,") is in common use as an ingredient of cooling drinks.

Another plant belonging to this region is *Cerasus ilicifolius* ("wild plum.") This is also an evergreen, and has thick pale green spinously serrate leaves. Its fruit, when mature, is of a yellowish pink color, with a pulpy external portion scarcely exceeding a line in thickness. Though the fruit has a pleasant taste, it would scarcely be considered worth eating in a country which was not, like this, almost destitute of wild fruits.

The scrub oaks growing here are all evergreen, with rigid coriaceous repandly toothed leaves, which are very variable in size and shape, even in the same individual. The fruit of all the species is of about the medium size and form, and is collected in large quantities by the Indians, who use it in preparing their favorite article of food, which they call "Atole."

Cercocarpus parvifolius is another characteristic plant of this region, and is remarkable for its long, spirally-tailed seeds. It is quite a handsome shrub, growing in clumps, and throws up wand-like branches to the height of five or ten feet. This is pretty exclusively confined to the higher elevations, and even reaches to the summit ridge.

We notice, also, as an inhabitant of these localities, *Frangula Californica*, Gray, (*Rhamnus *tomentellus*, Benth. Pl. Hartweg,) a species which appears to have a wide geographical range. Mr. Hartweg's specimens were collected among the mountains of the Sacramento valley, and we have seen others which were found by Dr. A. Randall near the head waters of the Gila river.

In the more southern portions of this district, and growing very abundantly in the vicinity of the boundary line, we find the pretty *Adenostoma sparsifolia*, (Torr. in Emory's report.) This grows more plentifully among the mountains than the already mentioned *A. fasciculata*, though the two agree closely in habit and are frequently found side by side. It grows in clumps, formed of numerous slender branches, and attains a height of four or eight feet. The upper part of each branch divides near the summit into a fine spray, clothed with yellowish green leaves, and, in the proper season, thickly set with small white flowers. The leaves and upper stems are covered with a glandular varnish, which exhales a pleasant aroma resembling that of *Aspidium fragrans*.

Other shrubs that may be noticed as characteristic of this region are the *Eriodyction Californicum* and *Chamæbatia foliolosa*, (Benth.;) the latter recently figured by Torrey in Plantae Frémontianae, in the Smithsonian Contributions. The shrubbery of this district is marked by a very intricate mode of growth, especially that upon the Coast Range of mountains. Here, so densely interwoven is the close mass of stunted bushes, that it is nearly impossible to force one's way either up or down the mountain sides.

This region furnishes a large variety of herbaceous plants. The greater number of those which, in the accompanying list, are referred to the "Mountains east of San Diego," have their localities in this district. Among the crevices of rocks grow several species of ferns, of the genera *Aspidium*, *Gymnogramma*, *Cryptogramma*, *Adiantum*, *Woodwardia*, &c. Mosses are rare, and but few lichens are observed; among the latter are the singular *Ramalina Menziesii*, Taylor, (*R. retiformis*, Menzies,) and species of *Parmelia*, *Roccella*, and *Evernia*.

THE PROPER MOUNTAIN REGION.

The immediate summit ridge, which is elevated to a height of from 3,000 to 5,000 feet above the sea, bears a rather meagre fringe of pines and other trees of the same family. This imparts a peculiar feature to the landscape, and recalls to mind the snows and wintry climate of high latitudes. Of the genus *Pinus* proper we find four species, some of them being dwarfed representatives of those forest monarchs which are so abundant and conspicuous further to the north.

In this region we encounter, though rarely, the majestic *Pinus Lambertiana*, with its enormous drooping cones. *P. Sabiniana* is more abundant. This species is remarkable for its singular fruit, each scale of which is tipped with a hard curved spine. The size and shape of this fruit are much like that of the pine apple.

Another species, *P. deflexa*, (Torr.,) has a trunk of elegant columnar form, and frequently attains to majestic proportions, even in these unfavorable situations. The fourth species is a *nut-pine,* and is described by Dr. Torrey in the accompanying enumeration as *Pinus Llaveana*.

This species is somewhat isolated in habit, and, as far as we have ascertained, has a very limited range near the dividing ridge and south of the boundary line. In the character of its fruit and foliage this species is closely allied to *Pinus monophylla*, (Torr.,) though quite distinct. It has a very compact, symmetrical form. The young individuals present a regularly oval mass of foliage, which, reaching the ground, completely conceals the stem and branches. Older plants attain a height of from 25 to 40 feet, and show a short trunk which supports a rounded head. This species bears an edible nut, which is collected by the Indians as an article of food.

Besides the pines, the other *Coniferæ* are *Abies Douglasii* and *Thuja occidentalis.*

We always find upland oaks associated with the pine growth of this region. These include the common *Quercus agrifolia* and *Q. densiflora*, the latter species being the more common upon the higher ridges. It is of stocky habit, and has wide-spreading branches, which form large spherical heads. The bark of this tree appears like that of the elm, and the wood is close-grained and durable.

There is another oak, which has deciduous leaves, the two preceding being evergreens. It seems to be closely allied to or identical with *Q. tinctoria.* Of this species there are two varieties which are only distinguishable by the fruit, which in one has a large and prominent gland, while in the other the gland is almost concealed by the cup—characters which seem to be constant in the same individuals.

The shrubbery of this region presents but little variety, and consists mostly of species which have been enumerated as belonging to the Lower Mountain district.

We naturally expect to find here the undergrowth which, in all countries, accompanies the pine forest. Here, indeed, grows the woodland strawberry, (*Fragaria vesca,*) while liliaceous plants are represented by *Cyclobothra alba;* we also meet with *Viola lobata*, a recently described species of Bentham. But of *Orchidaceæ*, so common elsewhere in such localities, we have only a solitary species of *Platanthera.* Curices are sparsely distributed, and *Potentilla*, so common in northern latitudes, has a place in our catalogue. The well-watered valleys are covered with a fine sward of native grasses, and lichens of sparkling yellow decorate the decaying pines.

VEGETATION OF THE EASTERN SLOPE OF THE MOUNTAINS, THE DESERT, AND THE BASIN OF THE COLORADO.

The features which vegetation presents, within the limits of this section, may be best described by noticing those which would naturally attract the attention of the traveller. The vegetation of the summit ridge differs but little upon its eastern and western side; but as we go further down the abrupt eastern descent a new group of plants comes into view, one which presents a marked contrast to that occupying the corresponding Lower Mountain region of the Pacific side. Here thorny shrubs and stiff-stalked plants of strange aspect meet the eye. The ashen colored mountains, which in the distance seem entirely destitute of vegetation, produce in their rocky cañons and crevices a great variety of singular forms. Cacti again appear, and, except in one or two instances, are all different from those found on the Pacific slope. There are several *Opuntias*, both those with cylindrical and those with elliptical stems. The gigantic *Echinocactus cylindraceus* lifts its bristling trunk from the clefts of the rock, and the humbler mamillaries are also met with. A new species of *Cereus* (*C. Engelmannii*) grows in these localities, and bears a deliciously palatable fruit.

On the upland plains, near the edge of the desert, we find a beautiful shrub with willow-like foliage and trumpet-shaped flowers. This showy plant is *Chilopsis linearis.* Here we also encounter a species of *Krameria*, having long and spiny branches and deep purple flowers, and new *Rhumnaceous* shrub (*Zizyphus Parryi*, Torr.) makes its appearance. Upon the hill sides here grows a species of *Agave*, the "Mezcal" of this region. The root of this, when prepared by a kind of underground roasting, serves as an important article of food for the Indians. Here we also find the "Spanish Bayonet," a species of *yucca*, which presents its spine-armed leaves to the traveller. As we proceed, the lower valleys assume a complete desert-like character. The "creosote bush" (*Larrea Mexicana*) makes its first appearance, to be our constant companion for the remainder of the journey. Perhaps the most striking plant of these wastes is the *Fouquieria splendens*. This grows in clumps, consisting of from twelve to twenty long wand-like branches, which, springing from the main stem close to the ground, rise to the height of from ten to fifteen feet; the stems are beset with rows of spines, from the axils of which grow small fassicles of leaves. Its bright scarlet flowers only appear at the time when the stalk is destitute of leaves, and hence the whole plant has too naked an appearance to exhibit much beauty.

The well-known mezquite, (*Algarobia glandulosa*,) which we shall notice more particularly hereafter, now becomes a common shrub; and near the base of the mountains a species of palmetto is seen growing in the clefts of the rocks. Its appearance in these localities invariably indicates the presence of water, though this is frequently found to be too saline for use.

As we advance upon the desert plain a very distinct character of vegetation presents itself. On all the gravelly ridges near the mountains we find the stiff stalks of *Fouquieria*. In the furrowed rain-water courses there is usually a growth of shrubbery larger than in other portions of the desert. In such situations a small tree of graceful outline occurs—the *Dalea spinescens*, (Gray, Pl. Thurb.) The finely divided branches of this plant are all terminated by sharp points, and are covered with a silvery pubescence. It bears a few abortive leaves, and an abundance of bright blue flowers. Further on in the desert the vegetation is chiefly composed of *Larrea mexicana* and *Obione canescens*. Near the borders of the lakes and gullies which mark the position of "New river" we find a greater variety among the plants. A very rank growth of a species of *Amaranthus* borders the lakes in wet seasons, and on the upper clay borders of "New river." The annual "Gramma grass" yields, after the rains or the overflows of the rivers, a rapid growth of evanescent but highly nutritious fodder. We find in these situations a species of *Boerhavia* and one of *Kallstroemia*. The mezquite trees near these places attain a considerable size, and frequently bear upon their branches a vigorous growth of a peculiar misletoe.

As we descend from the table land of the desert, by the steep bluff which bounds the alluvial bottoms of the Colorado river, the vegetation consists almost entirely of dense thickets of mezquite, but it assumes a more varied character when we reach the alluvial tracts. On all places liable to overflow the cotton-wood and willow abound, the latter forming a thicket along the immediate margin of the river. The higher grounds near the river seem especially favorable for the mezquite, and we find it growing with greater luxuriance than we have seen it elsewhere. In some situations it forms thorny and impervious thickets, but it is usually sufficiently scattered to permit an easy passage for man or beast. The irregular growth of this tree renders it unfit for most of the uses for which timber is needed. As an article of fuel it is scarcely inferior to hickory, and the wood is very durable. The fruit of the mezquite is of the greatest value to the traveller in these regions. It is a long bean-shaped pod, which is greedily devoured by cattle and is found to be highly nutritious. A gum exudes from this tree which closely resembles gum arabic in its chemical characters. The production of the gum is evidently increased by incisions made at certain seasons of the year, and especially by the proximity of fire ; facts which may be turned to account if the gum should ever be collected as an article of commerce. Growing with the mezquite, though preferring a moister soil, is the *Strombocarpa pubescens*, or "screw bean," as it is called, on account of the twisted form of its pods. It is usually of small growth, and is rarer than the mezquite. The fruit is also used as food for animals, but is less valuable than that of the mezquite.

The principal undergrowth consists of *Tessaria borealis*, a shrubby composita, which grows upon light dry soil in thick masses. Its straight branches are from four to eight feet high ; the younger portions of which, as well as the leaves, are covered with a silvery pubescence. In low saline places we find several chenopodiaceous plants; Salicornia, among others, which here becomes a stout shrub of two or three feet in height. These localities also furnish the singular *Dicoris*, a notice of which appears in Dr. Torrey's Appendix to Emory's Report.

A kind of soft cane grass (*Arundo Phragmites*) grows along the river's margin, and is the principal reliance for fodder in this region. Two other kinds of grasses are met with in similar situations, the seeds of which are collected for food by the Indians living near the river. One of these is a *Panicum*, the seeds resembling millet. The other has digitate spikes, resembling *Eleusine*. The flour made from the seeds of these wild grasses is husky, but quite palatable ; and it may be remarked, that species of the genera from which it is derived are in common cultivation in the eastern hemisphere.

Many ravines occur on the eastern edge of the desert, by means of which its drainage reaches the valley of the Colorado; these furnish some of the most interesting plants in the district. Here we again encounter the silvery chapparal tree, before noticed, (*Dalea spinescens;*) also, another of the same natural family, *Olneya Tesota*, (Gray, Pl. Thurb.) This is a good sized tree, having much the habit of the common locust. Its fruit consists of short irregular pods, which contain two large orbicular seeds. The flowers were not seen. We also find here the tree frequently referred to in Major Emory's Report as the "green-barked acacia" of the valley of the Gila. This is *Cercidium floridanum;* and in these localities it is quite a large tree, resembling the weeping willow in habit. Its long drooping branches bear an abundance of pods.

Fouquieria grows upon all the gravelly hills, and the cactus family are represented by a slender, cylindrical, much branched, and horribly spinose *Opuntia*, (*O. ramosissima*, Engel. n. sp.)

Much yet remains to be learned respecting the vegetation of this singular region, especially that of the eastern base of the mountain range. Only enough is known at present to prompt the desire of a thorough botanical exploration of its floral riches.

On taking leave of this branch of our subject, we briefly notice a few general facts connected with the vegetation of the country under consideration. One of the most striking botanical characteristics of this region, and one which attracts the attention of the most casual observer, is the great preponderance of evergreen shrubs. This is not only true of the seacoast and desert, but also of the higher mountain ranges. This fact has an important bearing upon the aspect of the scenery, which would otherwise be desolate indeed in a country exposed to an uninterrupted drought of seven months duration in each year. Though the verdure has not the vivid freshness of spring, but is even inclined to a leaden hue, yet the relief to the eye will be readily appreciated when contrasted with those complete deserts, whose universal barrenness seems increased rather than relieved by the repulsive spine-clad cacti or bristling yuccas.

Another peculiarity is the general prevalence of a balsamic odor. This is especially true of the most arid tracts, and serves to give a somewhat stimulating property to the atmosphere. This odor is due not only to the abundance of artemisias, but to a great variety of plants, especially those of the Labiate order, such as species of *Salvia* and *Audibertia*. Most of the *Compositæ* found here are more or less aromatic. In all cases the aroma seems to depend upon a resinous exudation, which probably performs the office of checking evaporation, by closing the pores of the leaves, and thus enables the vegetation of these arid tracts to survive the long continued dry season.

The effect of the peculiarities of the climate upon the vegetation of this region may be noticed here. The singular alternations of wet and dryness, heat and cold, produce a confused blending of seasons. Upon the immediate coast most of the annuals and those perennial plants having a succulent nature make their growth during the winter months, that being the season of rain.

In this latitude vegetable growth meets with but very little impediment from cold, as in these months the temperature rarely falls below the freezing point. When the November rains commence falling vegetation puts on its spring aspect, every barren hill is soon clothed in green, and by midwinter flowers are blooming in profusion everywhere, and many have even passed their brief season and have gone to seed. At this time the larger trees and deciduous shrubs drop their leaves, and only resume them at the close of the rainy season. This seeming exception to the general activity of vegetable life during the winter months is accounted for by the fact that the class of plants alluded to is almost exclusively confined to the margins of streams, hence their growth depends less upon moisture from the atmosphere. As dryness advances, during the months of May and June, all the evanescent forms are swept away, and the profusion of spring flowers gives place to the scanty products of the arid summer. Finally, these two yield to a still more sparse autumnal growth, which is mainly confined to the courses of streams. On the mountains, however, we find the alternation of seasons more like that of temperate climates. Here there is a winter sufficiently cold to prevent and a summer sufficiently moist to favor vegetable growth, which continues throughout the latter season. The scanty vegetation upon the eastern side of the mountains and along the Colorado is but partially watered by the uncertain showers of summer, and depends mainly upon the regular overflowing of the river. As the waters recede, the inundated places are speedily covered by a very rapid growth.

An enumeration of the plants observed, with precise and detailed accounts of the most interesting among them, will be found in the accompanying memoir by Professor John Torrey.

AGRICULTURAL CAPACITIES.

We will conclude this general sketch by briefly considering the agricultural capacities of the country, as indicated by its general geological features, its climate, and the natural botanical productions.

Commencing at the coast, we notice a prominent wall of high tertiary stuff abutting on the sea. This portion, which is thinly clad with verdure at any season, presents an uninviting aspect. Hence it happens that to the traveller who views it from the sea it is forbidding in the extreme. At a variable distance inland, however, where we find the line of settlements, the rounded hills are covered with a deep rich loam, which in the spring produces a luxuriant crop of wild oats. The river margins of this section are also of the same fertile character, and support a rank vegetation. Along this belt, too, lie fruitful plains, which, when clothed with the pasturage of early spring, excite the admiration of the beholder.

As we approach the junction of the tertiary and the granitic exposures barrenness again prevails. The thin soil, which is here confined to the crevices of the rocks, produces a growth of shrubbery, the stunted character of which indicates its unproductive nature. Proceeding further inland, we find among the basin-shaped mountain valleys large trees and rich pasture grasses, denoting that a fertile soil again appears. This character, more or less varied by local causes, extends to the summit level.

Occasionally terraces are found upon the higher mountain slopes which possess a productive clay soil, well adapted to the growth of winter grains. In general, however, these localities are rugged and barren. From these facts it would appear that this country possesses a large share of fertile soil, but in estimating its agricultural capacities we must also take into consideration the peculiarities of the climate if we would arrive at correct conclusions. It is owing to the fact that this latter is not taken into account that such discrepancies occur in the statements of travellers, who, according to the season at which they view the country, pronounce it sometimes a desert and at others a garden. Let any one follow up the coast in the month of March, and pass over the verdant plains that stretch towards the sea; let him see every valley and hill clothed in the rich green of the wild oats, and every snow-fed stream running with clear water, and he will exclaim, "This is Arcadian land, the realization of the poet's song." But let him pass over the same region in the month of August or September, when nearly every green thing has disappeared, when, instead of soft breezes wafting over refreshing verdure, the heated air rises with a wavy tremor from the parching ground; let him visit the land when nothing remains of the streams but the dry beds, and the herds of cattle, which before were roaming at large in the enjoyment of the rich pasturage, are gathered in herds around the margins of the stagnant marshes, and the same traveller will pronounce the country to be a desert unfitted for the abode of man or beast.

Here, then, we have two widely differing extremes, between which lies the proper mean.

The true mode, then, of estimating how far this region is adapted to agriculture is to follow up the courses of the various streams which run towards the sea, and note the point at which the supply of water is constant, the width of the valley, and the nature of the soil at these places, and also whether the character of the surface will admit of irrigation. We then have the data for forming a just opinion as to the value of the land for husbandry. If the observations are made further inland, among the mountains, then the increase of elevation must be taken into account. The winter here brings snow, and the summer is shorter than it is near the sea level. Hence the length of the growing season is diminished, but while it continues growth is extremely vigorous, especially in the month of June. The abundant supply of water, wood, and the bracing mountain air, compensate for a frequently inclement winter, the difficulty of transportation, and a short summer season.

The founders of the early mission establishments in this region seem to have had a clear appreciation of these facts, and their locations were wisely selected, so as to embrace the widest extent of cultivable land, and the best situations for farms are still found to be in their vicinity. These missions occupy the valleys of the main water-courses, generally at that point where the supply of water can be depended upon in all seasons. Their aqueducts, bringing water from towards the sources of the streams or from local springs, were often of great length and magnitude. The one belonging to the San Diego mission, for instance, is a continuous wall of masonry for the distance of nearly three miles. The upper portion of each valley was generally occupied by a branch dependency of the main mission, thus securing the entire control of the agricultural resources of the valley.

In regard to the eastern slope of the mountain but little additional need be said. In the immediate vicinity of the summit ridge arable land is found, but the more precipitous slope renders this too limited in extent to claim much attention. Desert valleys and pent up cañons succeed between this and the great plain. As far as all agricultural purposes are concerned this is truly a desert, though it is not, as is generally supposed, a mere waste of shifting sands, and destitute of every kind of vegetation.

We have already noticed that several shrubs are peculiar to this tract, which, if they serve no other purpose, at least afford relief to the eye.

The borders of "New River" being subject to frequent if not regular overflow, would seem to present some opportunities for the limited cultivation of maize, beans, pumpkins, and melons, such as is practiced by the Indians on the Colorado, and the existence of "gramma grass" on the higher adjoining ground would seem to indicate that quickly maturing cereals might be raised here.

The supply of water might, moreover, be rendered more constant and equable by the construction of artificial reservoirs and ditches. Still we must admit that any system of cultivation must be very precarious in a location where its success depends upon such variable causes.

The remarks respecting "New River" apply in a great measure to the Colorado. Here the cultivation is, of necessity, confined to those portions of the valley that are subject to overflow and the consequent deposition of fertilizing sediment. The higher adjoining lands, being without the reach of these influences, are, from their extreme aridity and the light porous nature of their soil, quite unfit for any cultivation.

All the Indian settlements upon the Colorado with which we are acquainted are located with reference to an overflowed portion of the river margin. Near the junction of the Gila with this river one Indian village occupies an old river bed, which, when the river is high, is completely covered by the stream. Another settlement is situated upon a low alluvial delta lying between the two rivers, and a third is built in a slough. These are also flooded at high water. The articles cultivated by these Indians are principally maize, beans, and pumpkins. No doubt that cotton, sugar, and many of the sub-tropical fruits would succeed here, but our present knowledge respecting the extent of arable soil, of the vicissitudes of the climate, and of the character of the different seasons, is too vague to warrant any but the merest conjecture in regard to its future agricultural importance.

UNITED STATES AND MEXICAN

BOUNDARY SURVEY,

UNDER THE ORDER OF

LIEUT. COL. W. H. EMORY,

MAJOR FIRST CAVALRY, AND UNITED STATES COMMISSIONER.

BOTANY

OF THE BOUNDARY,

BY

JOHN TORREY.

BOTANY.

RANUNCULACEÆ.

Clematis reticulata, *Walt.* var.? foliis tenuioribus, etc., *Gray, Pl. Wright*, 2, *p.* 7. Valley of the Cibolo, Chihuahua; *Bigelow.*

Clematis Pitcheri, *Torr. & Gray, Fl.* 1, *p.* 10. Hills of the Limpia and other places in western Texas; *Bigelow.*

Clematis ligusticæfolia, *Nutt.; Gray, Pl. Fendl. p.* 3. Copper Mines, New Mexico; *Bigelow*, and westward to California; *Nuttall, Fitch.*

Clematis lasiantha, *Nutt. in Torr. & Gray, l. c.* (Tab. I.) In various places, California, *Parry.* C. pauciflora, *Nutt.*, of which I have a specimen in fruit, kindly sent to me by that excellent botanist, appears to be a form of this species with smaller leaves and flowers than usual. Dr. Parry also found it at San Diego, but with male flowers only. Seemann refers C. lasiantha to C. Peruviana, *DC.*

Clematis Drummondii, *Torr. & Gray, l. c.* Along the tributaries of the Rio Grande, western Texas, and the Mexican States west of that river.

Atragene alpina, *Linn. Sp. p.* 764. A. Ochotensis, *Pallas; Gray, Pl. Fendl. p.* 4. Sides of Ben Moore, near the Copper Mines of New Mexico; April; *Bigelow.*

Thalictrum Fendleri, *Engelm. in Pl. Fendl. p.* 5; *Gray, Pl. Wright, p.* 7; *Torr. Pl. Whipple, p.* 61. Copper Mines, New Mexico; *Bigelow*, Sierra del Pajarito, Sonora; *Schott*, Monterey. California; *Parry.*

Anemone Caroliniana, *Walt. Fl. Car. p.* On the upper Rio Grande, western Texas, and Chihuahua. Root an oblong black tuber.

Myosurus minimus, *Linn. Sp. p.* Banks of streams, Chihuahua, April; *Bigelow.* On the lower Rio Colorado, Sonora; March; *Schott.*

Ranunculus trachyspermus, *Engelm. & Gray, Pl. Lindh.* 1 *p.* 3. Prairies of western Texas; *Wright.* Sonora; *Schott.* The two varieties of Engelm. (l. c.) pass into each other.

Ranunculus aquatilis, var. divaricatus, *Gray, Man. ed.* 2, *p.* 7. R. divaricatus, *Schrank; Gray, Pl. Wright*, 2, *p.* 8. On the Mimbres, New Mexico; May- -July; *Bigelow, Thurber.*

Ranunculus Cymbalariæ, *Pursh; Torr. & Gray, Fl.* 1, *p.* 17. San Elceario, etc., on the Rio Grande; June; *Bigelow.*

Ranunculus affinis, *R. Brown; Hook. Fl. Bor.-Amer.* 1, *p.* 12, *t.* 6. Copper Mines, New Mexico; June—August; *Bigelow.*

Ranunculus hydrocharoides, *Gray, Pl. Thurb. p.* 306. Wet meadows, Mababi, Sonora; *Thurber.*

Ranunculus macranthus, *Scheele in Linnæa*, 21, *p.* 585. R. repens, var. macranthus, *Gray, Pl. Lindh.* 2, *p.* 141, *& Pl. Wright*, 2, *p.* 8. Wet grassy places on the Limpia; June—July; *Bigelow.*

RANUNCULUS REPENS, var. MARILANDICUS, *Torr. & Gray, Fl.* 1, *p.* 31. Hills west of the Copper Mines, New Mexico; June; *Bigelow.*

RANUNCULUS CALIFORNICUS, *Benth. Pl. Hartw. p.* 295; *Torr. Pl. Whippl. in Pacific R. Road Expl. p.* 62. Monterey, and near San Francisco, California; March—May; *Thurber, Parry.*

RANUNCULUS HEBECARPUS, *Hook. & Arn. Bot. Beechey, p.* 369; *Torr. l. c.* R. parviflorus, *Torr. & Gr. Fl.* 1, *p.* 25, non *Linn.*

DELPHINIUM AZUREUM, *Michx. Fl.* 1, *p.* 314. On the upper Rio Grande, and westward to California; April—June.

DELPHINIUM CALIFORNICUM, *Torr. & Gray, Fl.* 1, *p.* 31. Monterey, California; May; *Parry.*

DELPHINIUM PATENS, *Benth. Pl. Hartw. p.* 296. In various parts of California, near the coast; *Parry, Thurber.*

DELPHINIUM MENZIESII, *DC. Syst.* 1, *p.* 355; *Lindl. Bot. Reg. t.* 1192. Near San Diego, etc., California; March; *Parry.*

DELPHINIUM DECORUM, *Fisch. & Mey. Ind. Sem.* (3) *Petrop. p.* 33. Monterey, California; May; *Parry.* Napa county, *Thurber.*

DELPHINIUM SCOPULORUM, *Gray, Pl. Wright,* 2, *p.* 9. Hills near the Copper Mines, New Mexico; *Bigelow.*

DELPHINIUM NUDICAULE, *Torr. & Gray, Fl.* 1, *p.* 33 *&* 661. Var. caule folioso. Napa county, California; March; *Thurber.*

DELPHINIUM CARDINALE, *Hook. Bot. Mag. t.* 485. D. coccineum, *Torr. in Bot. Whipp. Rep. l. c. p.* 62. (TAB. II.) Mountains east of San Diego, California; *Parry.* This may prove to be a variety of the last species, but the lobes of the leaves are much longer, and taper to a narrow point. It is a splendid plant, with large scarlet flowers. Dr. Parry collected it in the year 1850, and I have distributed specimens of it under the MS. name quoted above. Our plate was engraved before the figure in the Botanical Magazine was published.

AQUILEGIA LEPTOCERA, var. FLAVA, *Gray, Pl. Wright,* 2, *p.* 9. Organ mountains, near Doña Ana, New Mexico, and on hills at the Copper Mines; April—July; *Parry, Bigelow.* Banks of rivers, Sonora; *Thurber, & Capt. E. K. Smith.*

AQUILEGIA CANADENSIS, *Linn.; Torr. & Gray, Fl.* 1, *p.* 29. *β. Torr. in Bot. Whipp. l. c. p.* 62. Ravines and hill sides, near Monterey, California; May; *Parry.*

PÆONIA BROWNII, *Dougl.; Bot. Reg.* 25, *t.* 30. Sides of hills above and below Sta. Barbara; also near San Luis Obispo, California, May; *Parry.* The carpels vary in number from 3 to 5.

MENISPERMACEÆ.

COCCULUS CAROLINUS, *DC. Syst.* 1, *p.* 524; *Gray, Gen. Ill.* 1, *t.* 28. Wet ravines, valley of the Pecos, and on the lower Rio Grande, Texas.

BERBERIDACEÆ.

BERBERIS (MAHONIA) AQUIFOLIUM, *Pursh, Fl.* 1, *p.* 219, *t.* 4, (*excl. fig.* 7.) Near Monterey, California; *Parry,* and on hills at the Copper Mines, New Mexico; *Bigelow.*

BERBERIS (TRILICINA) FREMONTII; foliis 2—3-jugis, jugo ad basim petioli approximato, foliolis ovato-lanceolatis vel late ovatis repando-dentatis; dentibus spinescentibus; racemis paucis erectis laxe 5—7-floris folium subaequantibus; pedicellis flore subduplo longioribus. B. trifoliata, *Torr. Bot. Whipp. p.* 63, *ex parte, non Moric.* Western Texas and New Mexico; *Bigelow, Thurber.* Cañon of the Guadaloupe river, Sonora; *Capt. E. K. Smith.* A handsome shrub 5—10 (rarely 15) feet high, Leaves coriaceous and rigid; leaflets 1—2¼ inches long, sometimes truncate or cordate at the base, the middle one usually much longer than the others, and with more numerous teeth; the lowest pair situated close to the base of the petiole. On some specimens the primary leaves are reduced to small branching prickles, as in Berberis proper. Racemes 1—3 together; the pedicels 4—5 lines long. Flowers about as large as in the common Barberry. Filaments inappendiculate. Berries somewhat ovate, dark blue, about the size of currants. This species was first discovered by Frémont, in 1844, on the tributaries of the Rio Virgen, in southern Utah. It is nearly allied to B. trifoliata, but differs in the number of leaflets, longer racemes, and blue berries.

BERBERIS TRIFOLIATA, *Moric. Pl. Nouv. Amer. p.* 113, *t.* 69; *Gray, Pl. Lindh.* 2, *p.* 142. Western Texas, and on hills near the Copper Mines, New Mexico; *Bigelow.* Westward to Chihuahua, Nuevo Leon, etc.; *Gregg, Thurber.* The bright red acid berries are used for tarts, and are less acute than those of B. vulgaris.

NYMPHAEACEÆ.

NUPHAR ADVENA, *Ait. Kew. ed.* 2, 3, *p.* 295. In water, Devil's river, western Texas; Sept. in fruit; *Bigelow.*

PAPAVERACEÆ.

ARGEMONE MEXICANA, *Linn; Torr. & Gray, Fl.* 1, *p.* 61. On the lower Rio Grande, Texas; *Schott.* Westward to California; *Parry.*

Var. HISPIDA A, hispida, *Gray, Pl. Fendl. p.* 5, Sonora; *Thurber.*

ARGEMONE FRUTICOSA, *Thurb. in Gray, Pl. Thurb. p.* 306. La Peña, Coahuila; *Thurber.*

MECONOPSIS HETEROPHYLLA, *Benth. in Lond. Hort. Trans.* (*ser.* 2) 1, *p.* 407; *Hook. Ic. t.* 733. Near the sea beach at San Diego, and at Santa Barbara, California; February; *Parry.* Our specimens are certainly annual.

ESCHSCHOLTZIA CALIFORNICA, *Cham.; Torr. & Gray, Fl.* 1, *p.* 664. Monterey, and various other parts of California; *Parry, Thurber.*

ESCHSCHOLTZIA DOUGLASII, *Hook. & Arn. Bot. Beechey, p.* 320. Ravines along the Rio Grande from Frontera to Eagle Pass; also in Chihuahua and Sonora; February—April.

PLATYSTEMON CALIFORNICUM, *Benth. l. c.; Lindl. Bot. Reg. t.* 1679; *Torr. & Gray, Fl.* 1, *p.* 65. Grassy places in various parts of California; *Parry, Thurber.* Most of the specimens belong to the variety *leiocarpum.* "Flowers ochroleucous, turning yellow in drying."

PLATYSTIGMA LINEARE, *Benth. l. c.; Hook. Ic. t.* 38; *Torr. & Gray, Fl. l. c.* Near San Luis Obispo, California; April; *Parry.*

MECONELLA CALIFORNICA, *Torr. & Frém. in Frém. 2d Rep. p.* Near San Francisco, California, on damp rocks; March; *Thurber.*

ROMNEYA COULTERI, *Harv. in Hook. Lond. Jour. Bot.* 4, *p.* 4, 74, *t.* 3. Borders of dry streams south of San Diego, California; *Parry.* A showy plant, with large white flowers, which, in some of the specimens, are 4½ inches in diameter. The mature capsules and seeds are not yet known.

DENDROMECON RIGIDUM, *Benth. l. c.; Hook. Ic. t.* 37; *Torr. & Gray, l. c.* (TAB. III.) In various parts of California, especially near the seacoast.

FUMARIACEÆ.

CORYDALIS AUREA, *Willd.* var. Siliquis breviusculis, etc., *Gray, Pl. Wright,* 2, *p.* 10. Dry ravines, Frontera; *Bigelow,* etc. Hueco mountains, Texas, March; *Thurber.*

DICENTRA? CHRYSANTHA, *Hook. & Arn. Bot. Beech. p.* 320, *t.* 73; *Torr. & Gray, Fl.* 1, *p.* 665. San Felipe, California; *Parry.* Between San Diego and the Rio Colorado; *Schott.* Monterey; *Mr. Andrews.* A tall branching plant, (3—4 feet high,) with showy golden yellow blossoms in panicles. It differs from Dicentra in the filaments of the two phalanges being united nearly to the summit, where alone they are distinct; in the dull verrucose horse-shoe-form seeds, which are thick on the margin, and destitute of a strophiole or crest; and, lastly, in a peculiar habit. The pollen is spherical, as in Dicentra. It may be considered as the type of a genus or subgenus, to which the name of Chrysocapnos would not be inappropriate.

CRUCIFERÆ.

CHEIRANTHUS ASPER, *Cham. & Schlecht. in Linnaea,* 1, *p.* 14, *excl. syn.* C. capitatus, *Dougl. in Hook. Fl. Bor. Amer.* 1, *p.* 38. Erysimum grandiflorum, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 96. Sandy hills near Monterey, California; May; *Parry.* The specimens are in flower and fruit. The siliques are an inch and three-quarters long, nearly two lines broad, and much compressed. Seeds narrowly winged, and sometimes partly in two rows. Cotyledons distinctly accumbent, although the radicle is, in some cases, slightly oblique. An original specimen of Nuttall's plant agrees exactly with ours, but it has only very young fruit. The ripe fruit and seeds have probably not been seen before.

ARABIS MACROCARPA. Turritis macrocarpa, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 75. Wet places, San Isabel, California; May; *Thurber.*

ARABIS PATULA. Turritis patula, *Graham; Gray, Pl. Fendl. p.* 7. Near the Mimbres, New Mexico; April; *Bigelow.* Sonora; *Parry.*

CARDAMINE ANGULATA, *Hook. Bot. Misc.* 1, *p.* 343, *t.* 69; *Torr. Bot. Whipp. Rep. p.* 65. C. paucisecta, *Benth. Pl. Hartw. p.* 297. California; *Parry.* The station not recorded, but probably Monterey.

DRYOPETELON RUNCINATUM, *Gray, Pl. Wright,* 2, *p.* 11, *t.* 11. Mountains of Chihuahua and Sonora; March—September; *Bigelow, Parry, Schott.* Hueco mountains, thirty miles east of El Paso, Texas; *Thurber.*

STREPTANTHUS LINEARIFOLIUS, *Gray, Pl. Fendl. p.* 7, *and Pl. Wright,* 1, *p.* 7; *and* 2, *p.* 10. Hills near the Copper Mines, June—August; *Bigelow.* Guadaloupe Cañon, Sonora; *Thurber.* Chihuahua; *Schott.*

STREPTANTHUS PLATYCARPUS, *Gray, Pl. Wright,* 2, *p.* 10. Mountain ravines, New Mexico; also, in western Texas and Chihuahua, along the Rio Grande, and west, to Sonora, March—April; *Bigelow, Parry.*

STREPTANTHUS CARINATUS, *Gray, l. c.* Ravines near El Paso; April. A showy species, and worthy of cultivation.

STREPTANTHUS PETIOLARIS, *Gray, Pl. Fendl. in not. p.* 7. Rocky hills, near the Limpia mountains, and Mountains of Muerte, etc.; July; *Bigelow.*

STREPTANTHUS LONGIFOLIUS, *Benth. Pl. Hartw. p.* 10; *Gray, Pl. Wright*, 2, *p.* 10. Rocky hills, western Texas, Near the Rio Grande, July; *Bigelow.*

STREPTANTHUS GLANDULOSUS, *Hook. Ic. t.* 40; *Torr. & Gray, Fl.* 1, *p.* 77. Napa county, California; *Thurber.*

STREPTANTHUS ARCUATUS, *Nutt. in Torr. & Gray, Fl. l. c.* Rocks on the seacoast, near San Francisco, California; April; *Thurber.*

NASTURTIUM PALUSTRE, *DC.*; *Gray, Pl. Wright*, 2, *p.* 10. Moist places, western New Mexico, Texas, and Chihuahua; April; *Bigelow, Thurber.* Variable in the length of the pods.

NASTURTIUM OBTUSUM, *Nutt. l. c.* Wet sandy places on the Rio Grande, from New Mexico to Eagle Pass; *Bigelow, Thurber.* Specimens from the lower Rio Grande have the pods nearly three-fourths of an inch long.

NASTURTIUM SESSILIFLORUM, *Nutt. l. c.* Brady's creek, Texas; *Thurber.*

NASTURTIUM CURVISILIQUA, *Nutt. l. c.* Napa county, California; *Thurber.*

BARBAREA VULGARIS, *Pr. Br.* var. pedicellis angulo recto patulis, *Benth. Pl. Hartw. p.* 297. On the Rio Mimbres, New Mexico; *Bigelow.* This resembles the California plant in the style.

THELYPODIUM WRIGHTII, *Gray, Pl. Wright*, 1, *p.* 3. Plains and low grassy places, Leon Springs, and along the Rio Grande, from forty miles below San Elceario to Eagle Pass; April—Sept.; *Bigelow, Schott.*

SISYMBRIUM CANESCENS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 85. On the Rio Grande, from El Paso downward; also, in New Mexico; Febr.—May. Leaves often coarsely dissected.

SISYMBRIUM DIFFUSUM, *Gray, Pl. Wright*, 1, *p.* 8. Rocks near the Limpia, Texas; hills near the Copper Mines; and rocky places, Puerte de Paysano; July—Sept.; *Bigelow.*

ERYSIMUM ASPERUM, *DC.*; *Torr. & Gray, Fl.* 1. *p.* 95; *Torr. Bot. Whipple, Rep. p.* 66. Western Texas, Chihuahua, Sonora, and California. An extremely variable plant, which may be referred to several nominal species.

GREGGIA CAMPORUM, *Gray, Pl. Wright*, 1, *p.* 9, *t.* 1. Hills and prairies, on the Pecos and upper Rio Grande; also, in Chihuahua and Coahuila. The cauline leaves vary from entire to repandly toothed.

DRABA MICRANTHA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 109. El Paso, and near the Copper Mines, March—April; *Bigelow, Thurber.* Guadaloupe Pass and Santa Cruz, Sonora; *Parry.*

VESICARIA DENSIFLORA, *Gray, Pl. Lindh.* 2, *p.* 145. Eagle Pass, and other places on the lower Rio Grande; March; *Schott.*

VESICARIA ARGYREA, *Gray, l. c.* Near Corallitus, Chihuahua; *Thurber.*

VESICARIA STENOPHYLLA, *Gray, l. c. & Pl. Wright*, 2, *p.* 13. Hueco mountains, Texas; *Thurber.* El Paso and Mule Springs; March—April; *Bigelow.* All the forms described by Gray occur in the collections.

VESICARIA RECURVATA, *Engelm. in Gray, l. c. & Pl. Wright, l. c.* Banks of the Leon, Texas, April; *Thurber.* Tucson, and on the Gila, Sonora; March; *Parry.*

VESICARIA PURPUREA, *Gray, Pl. Wright*, 2, *p.* 14. Hueco mountains, in rocky places, El Paso and Cook's Springs; March—April; *Bigelow, Thurber.* Guadaloupe Pass, &c., Sonora; March; *Parry.* The petals are only slightly purple, often almost white, and yellowish toward the claw.

Vesicaria lasiocarpa, *Hook.; Gray, l. c. p.* 13, *in not.* Elm creek, valley near the Rio Grande; *Schott.* Ringgold barracks; *Capt. E. K. Smith.*

Dithyræa Wislizeni, *Engelm. in Wisliz. Mem. N. Mex. p.* 11; *Torr. in Sitgr. Rep. p.* 280, *t.* 11. Prairies and sandy banks, El Paso to the Copper Mines; *Bigelow, Thurber.* Overflowed banks of the Gila; March; *Parry.*

Dithyræa Californica, *Harv. in Hook. Lond. Jour. Bot.* 4, *p.* 77, *t.* 5; *Englm. l. c.* Dry river beds of the Colorado, California; *Schott.*

Thlaspi Fendleri, *Gray, Pl. Wright,* 2, *p.* 15. Organ mountains and Copper Mines, New Mexico; April—May; *Bigelow, Thurber.* Guadaloupe Pass and Tubac, Sonora; February—March; *Parry.* The radical and lower cauline leaves are often denticulate.

Synthlipsis Greggii, *Gray, Pl. Fendl. p.* 116, *in not.* Hill-sides on the lower Rio Grande; common near Eagle Pass; March—September; *Schott.*[1]

Hymenolobus pubens, *Gray, Pl. Wright,* 1, *p.* 9. Wet places near Rock creek; July; *Bigelow, Parry.*

Lepidium alyssoides, *Gray, Pl. Fendl. p.* 10. Chihuahua and on the Pecos; *Thurber.* Low grounds near El Paso, and on the Organ mountains; May—October; *Bigelow.* Valley of the Gila; *Schott.* Santa Cruz valley, Sonora; *Thurber.* The late secondary leaves on specimens from the Organ mountains are deeply pinnatifid, and the segments toothed.

Lepidium Wrightii, *Gray, Pl. Wright,* 2, *p.* 15. Ravines near El Paso and at the Copper Mines; March—April.

Lepidium intermedium, *Gray, l. c.* Ravines, Organ mountains; April; *Bigelow.*

Lepidium latipes, *Hook. Ic.* 1, *t.* 41; *Torr. & Gray,* 1, *p.* 116. Mission of San Luis Rey, California; *Parry.*

Lepidium nitidum, *Nutt. in Torr. & Gray, l. c.* With the last; *Parry.* San Isabel, California; February; *Thurber.*

Lepidium Californicum, *Nutt. l. c.;* var. foliis bipinnatifidis; siliculis majoribus margine hispidis. With the last, and in the interior of the country as far east as the mountains.

[1] The following note is kindly furnished by my friend, Dr. Gray:

"Synthlipsis Greggii, (*Gray:*) canescens vel subcinerea; foliis abovatis oblongisve sub obatis vel sinuato-pinnatifidis plerisque petiolatis roseis albisve; siliculis ellipticis (nunc ovalibus) complanatis insigniter emarginatis, valvis dorso acutissimus apice marginato-subproductis. San Fernando, Coahuila; *Berlandier,* (No. 822, 2231 & 2242.) Berlandier's specimens, though green or glabrate, only the young parts being at all hoary, and the leaves larger and rounder, yet apparently belong to the same species as Dr. Gregg's plant, on which this genus was founded The silicles vary from four to seven lines in length, are oblong-elliptical, or sometimes broadly oval, with a pretty strong emargination at the apex, strongly ob-compressed, and with an acute margin. The root is probably only biennial. The specific character here given is to distinguish this species from the following:

"Synthlipsis Berlandieri, (sp. nov.): puberula; foliis oblongis pinnatifido-laciniatis, caulinis sessilibus; petalis luteis; siliculis orbiculatis subretusis, valvis ad apicem haud productis. Matamoras; March and April; *Berlandier,* (No. 710, 778, 1517, 2127, 2198, 3017, 3102.) Root apparently only biennial. Stems diffuse or decumbent, about a foot in length, puberulent, as is the foliage, &c., with a minute and inconspicuous stellular down. Leaves an inch or less in length, 3-6 lines wide, laciniately pinnatifid and toothed. Racemes elongated in fruit, secund; the pedicels four to eight lines long, recurved in fruit; style about the length of the canescent ob-compressed ovary. Silicle three lines in length and breadth, slightly retuse at both ends, or at least at the apex, tipped with a slender style of a line in length; the valves strongly navicular, barely acute on the back, which is not produced into a margin at the apex. Seeds eight to ten in each cell, orbicular, flat, marginless, on filiform free funiculi. This plant in flower might be taken for one of the glabrate species of Vesicaria, but its silicles, strongly flattened contrary to the narrow partition, and the position of the seeds, exclude it from that genus, and from the tribe of Alyssineæ; and manifestly refer it to Synthlipsis, with which it accords in habit."—(*A. Gray.*)

Capsella bursa-pastoris, *Moench; DC. Syst.* 2, *p.* 283. San Luis Rey, California. Doubtless an introduced plant.

Hymenolobus divaricatus, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 117. California; *Parry.* The station not recorded; probably San Diego.

Thysanocarpus elegans, *Fisch. & Mey. Ind. Sem. Hort. Petrop.* (1835) *p.* 50; *Torr. & Gray, Fl.* 1, *p.* 118, (var. γ.) Dana's Ranch, California; *Parry.* Napa, March; *Thurber.* Tucson, Sonora; *Parry.* The last is the most eastern station known of a species of this genus.

Thysanocarpus crenatus, *Nutt. in Torr. & Gray, l. c.* Santa Ana, California, March; *Parry.* Napa; *Thurber.*

Thysanocarpus laciniatus, *Nutt. l. c.* With the last. A more slender form than Nuttall's plant.

Rhaphanus Raphanistrum, *Linn.; DC. Prodr.* 1, *p.* 229. Naturalized abundantly on the lower Rio Grande and in the adjoining Mexican States.

CAPPARIDACEÆ.

Cleomella angustifolia, *Torr. in Gray, Pl. Wright,* 1, *p.* 11, *in not.* Gravelly places near Presidio del Norte, September; *Bigelow.*

Cleomella longipes, *Torr. l. c.* Saline plains, Sonora, June; *Thurber; Capt. E. K. Smith.*

Cleome Sonoræ, *Gray, Pl. Wright,* 2, *p.* 16. With the last; *Thurber.* Near the Mimbres, New Mexico; *Bigelow.*

Cristatella Tamesii, *Torr. & Gray, Fl.* 1, *p.* 123; *Gray, Gen. Ill.* 1, *p.* 177, *t.* 77. Between Victoria and San Antonio, Texas, October; *Schott.*

Polanisia uniglandulosa, *DC. Prodr.* 1, *p.* 242; *Gray, Pl. Wright, p.* 10. Sandy places on the Rio Grande; also on Cibolo creek and near the Copper Mines; April—July. Variable in the size of the flowers. Seeds smooth and rough, often in the same specimen.

Wislizenia refracta, *Engelm. in Wisliz. Mem. N. Mex. p.* 99; *Gray, l. c.* Alluvial soils near El Paso, May; *Parry, Bigelow.* Valley of the Gila; June; *Schott.* Sonora; *Thurber.*

Isomeris arborea, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 124.—(Tab. IV.) San Diego, California; May; *Parry, Thurber.* This interesting and handsome shrub deserves a place in our gardens.

RESEDACEÆ.

Oligomeris glaucescens, *Cambess.*; *Gray, Pl. Wright,* 2, *p.* 16. Common along the Rio Grande, also in Chihuahua and on the Gila.

VIOLACEÆ.

Viola adunca, *Smith in Rees Cyclop*; *Torr. Bot. Whippl. Rep. p.* 68. V. longipes, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 140. Near Monterey, California; April; *Parry.* Plains near the seacoast, San Francisco; *Thurber.* A form resembling Hartweg's No. 1660.

Viola ocellata, *Torr. & Gray, l. c.* New Almaden, California; April; *Thurber.*

Viola pedunculata, *Torr. & Gray, l. c.* San Luis Obispo; April; *Parry;* and San Diego to San Isabel, California; February; *Thurber.*

Viola lobata, *Benth. Pl. Hartw. p.* 298; *Torr. Bot. Whippl. Rep. p.* 68. Summit of the mountains east of San Diego, June; *Parry.* The leaves vary greatly. On the same specimen some of them are but slightly lobed, others are cut nearly to the base.

VIOLA CUCULLATA, *Ait.*; *Torr. & Gray, Fl.* 1, 139. Wet places near the Copper Mines and river Mimbres, New Mexico; April; *Bigelow, Thurber.*

IONIDIUM LINEARE, *Torr.*; *Gray, Gen. Ill.* 1, *p.* 189, *t.* 82. New Mexico and western Texas; west to Chihuahua and Sonora. It varies with the leaves broadly and narrowly linear, and from entire to acutely denticulate.

CISTACEÆ.

HELIANTHEMUM SCOPARIUM, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 152; *Benth. Pl. Hartw. p.* 299. Monterey and San Luis Rey, California; March—May; *Parry.*

HELIANTHEMUM CAROLINIANUM, *Michx. Fl.* 1, *p.* 307. Western Texas, August; *Wright.*

HYPERICACEÆ.

HYPERICUM FORMOSUM, *H. B. K. Nov. Gen. & Sp.* 5, *p.* 196, *t.* 160; *Gray, Pl. Wright,* 2, *p.* 17. Wet places near the Copper Mines, New Mexico; June—July; *Bigelow.* Santa Cruz, Sonora; *Thurber.*

HYPERICUM SCOULERI, *Hook. Fl. Bor. Am.* 1, *p.* 111. Mountains east of San Diego, California; June; *Parry.*

ELATINE AMERICANA, *Nutt.; Gray, Gen. Ill.* 2, *p.* 220, *t.* 95. Hills near the Copper Mines, New Mexico; *Bigelow.*

FRANKENIACEÆ.

FRANKENIA GRANDIFOLIA, *Cham. & Schlecht. in Linnaea* 1, *p.* 35; *Torr. & Gray, Fl.* 1, *p.* 168. Salt marshes and along the seashore near San Diego, California; June; *Parry.* Alluvions of the Rio Gila, Sonora; *Schott.* In Mr. Schott's specimens the leaves are much narrower than in those from the sea-coast.

CARYOPHYLLACEÆ.

SILENE ANTIRRHINA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 191. Western Texas; New Mexico and westward to Sonora and California.

SILENE PULCHRA, *Torr. & Gray, Fl.* 1, *p.* 675. Eastern slope of the mountains east of San Diego; *Parry.*

SILENE QUINQUEVULNERA, *Linn.; Torr & Gray, l. c.* Near Monterey, California; May; *Parry.* Probably introduced.

SILENE GREGGII, *Gray, Pl. Wright,* 2, *p.* 17. Ravine at the Copper Mines, New Mexico; August; *Thurber.*

ARENARIA BENTHAMII, *Fenzl.; Torr. & Gray, Fl.* 1, *p.* 675. Blanco river, Texas; *Wright;* and San Antonio, in the same State; *Thurber.*

ARENARIA DIFFUSA, *Ell. Sk.* 1, *p.* 519; *Gray, Pl. Wright,* 2, *p.* 18. Painted Camp; *Bigelow.*

ALSINE TENELLA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 179. A. tenuifolia, B. americana, *Fenzl. in Ann. Wien. Mus.* Monterey, California, May; *Parry.* Differs from A. tenuifolia in the less pointed sepals and in the seeds, which are 4 to 5 times larger, as well as more compressed, and marked with minute radiating rugæ.

ALSINE DOUGLASII, *Fenzl.; Torr. & Gray, Fl.* 1, *p.* 674. San Diego and Benicia, California; *Thurber.*

STELLARIA NITENS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 185. S. moenchioides, *Fenzl. l. c.* Grassy, moist places near San Diego; *Parry.* The flowers in our specimens are all apetalous.

STELLARIA MEDIA, *J. E. Smith, Engl. Bot. t.* 537. Santa Barbara and other parts of California; introduced from Europe.

PARONYCHIA RAMOSISSIMA, *DC. Mem. Paronych. p.* 12, *t.* 4; *Torr. & Gray, Fl.* 1, *p.* 72. San Luis Rey, San Diego, &c.; *Parry, Thurber.* The large, imbricated, scarious stipules give this plant a silvery appearance. There are commonly 5 stamens, with as many intermediate oblong scales which are about the length of the filaments.

PARONYCHIA JAMESII, *Torr. & Gray, Fl.* 1, *p.* 170; *Gray, Pl. Wright,* 1, *p.* 13. Ravines, Rock creek: July; *Bigelow.* Ojo de Vaca, Chihuahua; *Thurber.*

PARONYCHIA LINDHEIMERI, *Engelm. in Gray, Pl. Lindh.* 2, *p.* 152. Middle and western Texas. Near the last species.

SPERGULARIA RUBRA, *Pers. Syn.* 1, *p.* 504; *Gray, Gen. Ill.* 2, *p.* 25, *t.* 107. Banks of the Rio Grande and seacoast of California.

DRYMARIA GLANDULOSA, *Bartl.; Gray, Pl. Wright,* 2, *p.* 18. Hills and rocky places, Copper Mines, New Mexico; August—October; *Bigelow.*

DRYMARIA FRANKENIOIDES, *H. B. K.; DC. Prodr.* 1, *p.* 395. Plains near the city of Chihuahua; October; *Thurber.* Arroyo near the Rio Grande, in Chihuahua; *Parry.*

DRYMARIA SPERGULARIOIDES, *Gray, Pl. Fendl. p.* 11. Ravines and low places near Lascuta; July; and near the Copper Mines; August; *Bigelow.*

DRYMARIA EFFUSA, *Gray, Pl. Wright,* 2, *p.* 19. Hills near Santa Cruz, Sonora; September; *Thurber.*

PORTULACACEÆ.

CALANDRINIA MENZIESII, *Hook. Fl. Bor. Am.* 1, *p.* 223, *t.* 70. Grassy places near San Diego; March; *Parry.*

CALANDRINIA MARITIMA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 197. On the Coronados islands, on the coast of California; May; *Thurber.*

TRIANTHEMA MONOGYNA, *Linn.; DC. Prodr.* 3, *p.* 352. Plains of the Limpia, Texas; July; *Bigelow.* Magdalena and Sierra Verde; *Thurber, Schott.*

TALINUM AURANTIACUM, *Englm. in Pl. Lindh.* 2, *p.* 154 *& β.* ANGUSTISSIMUM, *in Gray, Pl. Wright,* 1, *p.* 14. Gravelly hills near Rock creek and Van Horn's Wells, Texas; *Bigelow.* Sandy places, Sonora; *Schott, Thurber.*

TALINUM PARVIFLORUM, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 197. Stony hills at the Copper Mines and El Paso, New Mexico; also in Western Texas; *Bigelow, Thurber.*

TALINUM REFLEXUM, *Cav. Gray, Pl. Wright,* 2, *p.* 20. Dry prairies and hill-sides, San Pedro river up to the Pecos, and along the Rio Grande from El Paso to Presidio del Norte; June—October.

TALINOPSIS FRUCTESCENS, *Gray, Pl. Wright,* 1, *p.* 15, *t.* 3. Gravelly hills along the Rio Grande, from El Paso downward to the mouth of Great Cañon; also on the Cibolo; June—August; *Parry, Bigelow.*

SPRAGNEA UMBELLATA, *Torr. Pl. Frémont, in Smithson. Contrib.* 6, *p.* 4, *t.* 1. Damp rocks, Napa county, California; *Thurber.*

CLAYTONIA PERFOLIATA, *Donn; Torr. Gray, Fl.* 1, *p.* 199; *Torr .in Bot. Whippl. Rep. p.* 70. Monterey, California; *Parry.* Var. PARVIFLORA, *Torr. l. c.* Napa county, California; *Thurber.*

CLAYTONIA VIRGINICA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 198. Ojo San Francisco; February; *Parry.*

SESUVIUM PORTULACASTRUM, *Linn.; DC. Prodr.* 3, *p.* 352. On the Rio Grande, from Doña Ana, New Mexico, to the Gulf; April—October. Common along the Gila; *Thurber.*

PORTULACA PILOSA, *Linn.; Engelm. in Gray, Pl. Lindh.* 2, *p.* 154; *Pl. Wright,* 1, *p.* 13. Howard's Springs and dry ravines near the Limpio mountains; July—August; also near the Copper Mines; *Bigelow.*

PORTULACA LANCEOLATA, *Engelm. l. c.* Rocky places, Mule Springs, and Puerte de Paysano; August—September; *Bigelow.*

MALVACEÆ.

MALVA BOREALIS, *Walm; Gray, Pl. Fendl. p.* 15. Monterey, California; *Parry.*

MALVASTRUM AMERICANUM. Malva Americana, *L. Sp. p.* 968, (non *Cavan.,*) *DC. Prodr.* 1, *p.* 430. On the lower Rio Grande; *Schott.* Rugel collected this species on Key West, Florida. (No. 89; *Shuttleworth.*)

MALVASTRUM MONROANUM, *Gray, Pl. Fendl. p.* 21. Malva monroana, *Dougl. in Bot. Reg. t.* 1306. M. fasciculata, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 225. Near San Diego, California; *Parry.*

MALVASTRUM THURBERI, *Gray, Pl. Thurb. p.* 307. Santa Cruz valley, Sonora; July; *Thurber.* I can find no sufficient characters for distinguishing this from M. Monroanum.

MALVASTRUM COCCINEUM, *Gray, Pl. Fendl. p.* 24. Gravelly and sandy plains on the Limpia, Rock creek, and Rio Grande; also in New Mexico, Chihuahua, and on the Gila.

MALVASTRUM PEDATIFIDUM, *Gray, Pl. Wright,* 1, *p.* 17. Frontera, Texas; March; *Bigelow, Parry.*

MALVASTRUM LEPTOPHYLLUM, *Gray, Pl. Wright,* 1, *p.* 17. Ojo de Vaca, &c. Chihuahua; *Thurber.* Our specimens are smoother than Wright's plant.

CALLIRHOË INVOLUCRATA, *Gray, Pl. Fendl. p.* 15, *Gen. Ill. t.* 117. Moist grounds, valley of the Pecos, and between Eagle Pass and Laredo, Texas. March—April; *Schott.*

SIDALCEA HUMILIS, *Gray, l. c. p.* 23. Sida malvæflora, *Hook. & Arn. Bot. Beechey, p.* 326, non *Lindl.* Monterey and near Santa Barbara, California; *Parry.* San Diego, *Thurber.*

SIDALCEA MALVÆFLORA, *Gray, Pl. Wright,* 1, *p.* 16. Sida malvæflora, *Moq. & Sesse. DC. Prodr.* 1, *p.* 194. Marshes of the Limpia and hills at the Copper Mines; July; *Bigelow.* Ojo de Gavilan and Rio Mimbres; *Thurber.* El Podrero, Sonora; June; *Schott.* It sometimes occurs with white flowers.

SIDA HEDERACEA, *Torr. in Gray, Pl. Fendl. p.* 23, *ad not.* New Mexico, on the upper Rio Grande, Sonora, and California; northward to Oregon.

SIDA FILICAULIS, *Torr. & Gray, Fl.* 1, *p.* —. Rocky and gravelly hills, Howard Springs, and between Van Horn's Wells and Muerte; *Bigelow.*

SIDA FILICAULIS, var. SETOSA, *Gray, Pl. Wright,* 2, *p.* 22. Rock creek and near the Great Cañon of the Rio Grande; *Bigelow, Parry.*

SIDA FILIPES, *Gray, Pl. Wright,* 2, *p.* 19. Crevices of rocks and ravines between the Pecos and San Pedro; *Schott.* El Paso; *Bigelow.*

Sida lepidota, *Gray, l. c. p.* 18. Plains near Leon Springs; September; *Bigelow.* Cocospera, Sonora, and east of Sierra Madre; July—September; *Schott.*

Sida physocalyx, *Gray, Pl. Lindh.* 2, *p.* 163. Hills between Van Horn's Wells and Muerte; May—July; *Bigelow.* Near Laredo; *Schott.* Fronteras, Sonora, and near the city of Parras, State of Coahuila; *Thurber.*

Sida longipes, *Gray, Pl. Wright,* 1, *p.* 31. San Pedro valley and on the Cibolo creek, also near Leon Springs; July—September; *Parry, Bigelow.*

Sida Elliottii, *Torr. & Gray, Fl.* 1, *p.* 232. Rocky places on the Limpio and at Van Horn's Wells, July; *Bigelow.* A dwarf form was found by *Thurber* at the Copper Mines.

Anoda hastata, *Cav.; Gray, Gen Ill.* 2, *t.* 124. Valley of the Cocospera, Sonora; September—October; *Schott.* Mount Carmel, near the Rio Grande, Chihuahua, November; *Parry.*

Anoda pentaschista, *Gray, Pl. Wright,* 2, *p.* 22. Zuñi mountains, August—September; *Bigelow.* Presidio del Norte and further down the Rio Grande; *Parry.* Sonora; *Thurber.*

Anoda Wrightii, *Gray, Pl. Wright,* 2, *p.* 22. Dry ravines along the upper Rio Grande, also rocky places on the Limpia; *Bigelow.*

Abutilon holosericeum, *Scheele in Linnœa,* 21, *p.* 471. Rocky hills between Painted Camp and Wild Rose Pass, also on Turkey creek; July—November; *Bigelow.*

Abutilon Texense, *Torr. & Gray, Fl.* 1, *p.* 231; *Gray, Pl. Wright.* Rocky hills on the Cibolo and mountains of Muerte, &c.; July—August. Valley of the Cocospera and Magdalena, Sonora; *Schott, Thurber.*

Abutilon crispum, *Don.; Gray, Gen. Ill.* 2, *t.* 126. Bogenhardia crispa, "*Reichenb. Repert. Herb.* 200, *No.* 7636." Rocky hills and ravines along the Rio Grande and its tributaries. Bachimba, Chihuahua, and Magdalena, Sonora; *Thurber.* Specimens from the latter station have remarkably villous stems.

Abutilon Thurberi, *Gray, Pl. Thurb. p.* 307. Shady places, Magdalena, Sonora; October; *Thurber.*

Abutilon parvulum, *Gray, Pl. Wright,* 1, *p.* 21. Flounce mountains and rocky hills between Van Horn's Wells and Muerte; June—July; *Bigelow.*

Wissadula mucronulata, *Gray, Pl. Berland. ined.* On the Rio Grande, below Reynosa, October; *Schott.* Leaves cordate, entire, green, and smoothish above, paler and somewhat velvety underneath. Peduncles paniculately several-flowered, the flowers very small, with obovate petals. Carpels obovate, smoothish, with 2 short horns, 4—5 seeded.

Sphæralcea angustifolia, *Spach; Gray. Pl. Wright,* 1, *p.* 21. S. stellata, *Torr. & Gray, Fl.* 1, *p.* 228. Moist, alluvial soils. Western Texas; June. On the Fronteras, Sonora; June—November; *Thurber,* A broad-leaved form was found by Schott at Eagle Pass.

Sphæralcea hastatula, *Gray, l. c. p.* 17. On the Rio Pecos; *Thurber.*

Sphæralcea incana, *Torr. in Gray, Pl. Fendl. p.* 23; *Pl. Wright,* 1, *p.* 21. El Paso; *Parry;* and Laguna los Putos, Chihuahua; *Thurber.* San Elceario, &c.; *Bigelow.* Var. dissecta, *Gray, l. c. p.* 21. Chihuahua; *Schott, Thurber.*

Sphæralcea Fendleri, *Gray, l. c.* Low grounds along the Gila; *Schott.* Santa Cruz, Sonora; *Thurber.*

Pavonia Wrightii, *Gray, Gen. Ill.* 2, *p.* 76, *t.* 130; *Pl. Lindh.* 2, *p.* 161. Shady borders of the tributaries of the lower Rio Grande; *Schott, Bigelow.*

MALVAVISCUS DRUMMONDII, *Torr. & Gray, Fl.* 1, *p.* 230; *Gray, Gen. Ill.* 2. *t.* 131. South-western and central Texas; *Thurber, Schott.* The baccate fruit is red when ripe.

KOSTELETZKYA (ORTHOPETALUM) PANICULATA, *Benth. Pl. Hartw. p.* 285. Mountain pass near Cocospera river; September; *Schott.* Corolla, deep rose color. Bentham regards this plant as the type of a distinct section or, perhaps, genus, differing from Kosteletzkya in the erect convolute petals.

HIBISCUS COULTERI, *Harvey in Gray, Pl. Wright,* 1, *p.* 23. Western Texas, near the Rio Grande; June—October.

HIBISCUS DENUDATUS, *Benth.* Var. INVOLUCELLATUS, *Gray, l. c. p.* 23. Gravelly table-lands of the Rio Grande, from El Paso down to the Cibolo; May—September; *Parry, Bigelow.*

HIBISCUS CARDIOPHYLLUS, *Gray, l. c. p.* 22. Dry limestone hills near the mouth of the Pecos; September—October; *Schott, Bigelow.*

THURBERIA THESPESIOIDES, *Gray, Pl. Thurber, p.* 308. (TAB. VI.) Cañon near Cocospera and Ymuris, Sonora; October—November; *Schott.* Mr. Schott informs me that this plant is called *Algodoncello* by the Sonorians.

BYTTNERIACEÆ.

MELOCHIA PYRAMIDATA, *Linn; Gray, Gen. Ill.* 2. *p.* 134 *and Pl. Lindh. p.* 165. Western Texas; *Schott, Bigelow.*

MELOCHIA TOMENTOSA, *Linn; DC. Prodr.* 1, *p.* 490. On the lower Rio Grande; *Schott.*

WALTHERIA DETONSA, *Gray, Pl. Wright,* 2, *p.* 24. Magdalena, Sonora; *Thurber.*

HERMANNIA TEXANA, *Gray, Gen. Ill.* 2, *p.* 88. *t.* 135. Ravines of Devil's river and plains near Howard's Spring; also at the mouth of the Pecos; September—October; *Bigelow.*

AYENIA PUSILLA, *Linn; Gray, Pl. Wright.* 1, *p.* 24, 2, *p.* 24. Dry rocky ravines, Van Horn's Wells, June; *Parry;* Sonora; *Thurber.*

AYENIA MICROPHYLLA, *Gray, l. c.* Rocky hills of the Rio Grande, near and below El Paso; *Parry, Bigelow.*

TILIACEÆ.

CORCHORUS PILOLOBUS, *Link; Gray, Pl. Wright,* 2, *p.* 24. Gravelly beach of the Island of Lost Rocks, lower Rio Grande, September; *Schott.* Santa Rosa valley; *Parry.*

LINACEÆ.

LINUM MULTICAULE, *Hook. in Torr. & Gray, Fl.* 1, *p.* 698; *Engelm. in Gray, Pl. Wright,* 1. *p.* 27. Valley of the Limpio; July; *Bigelow.*

LINUM BERLANDIERI, *Hook. Bot. Mag. t.* 3,480; *Engelm. l. c.* Live Oak creek and rocky places on the Rio Grande; also in Chihuahua.

LINUM PERENNE, *Linn; Engelm. l. c.* Plains between the Limpia and the Rio Grande, and westward to the Gila.

LINUM RIGIDUM, *Pursh; Engelm. l. c.* Gravelly hills from El Paso to San Eleazario; April—June.

LINUM RUPESTRE, *Engelm. in Gray, Pl. Lindh.* 2, *p.* 232. Rocky places on the Limpia and Rio Grande.

OXALIDACEÆ.

Oxalis Berlandieri (n. sp.): caulescens, pilosa; foliis trifoliolatis, foliolis oblongis v. obovato-oblongis plerumque emarginatis terminali valde petiolulato; pedunculis axillaribus subterminalibusque 3—5-floris folium subæquantibus erectis; petalis flavis. Sandy places in the prairies between Laredo and Ringgold Barracks, June; *Schott.* Rio Nueces, *Berlandier*, No. 1094 and 2524. Stems arising from a slender subterranean rhizoma, erect, 4—6 inches high, branching towards the base. Lateral leaflets 3—4 lines, terminal 5—6 lines long. Filaments unequal, 5 of them hairy, twice as long as the alternate smooth ones. Cells of the ovary about 4-ovuled. Capsule subglobose-ovate, scarcely as long as the sepals, strongly 5-angled; the cells one-seeded. Seeds strongly tuberculose-ribbed. Allied to O. psoraleoides. The only species of this section hitherto found within the limits of our Flora.

Oxalis dichondræfolia, *Gray, Pl. Wright.* 1, *p.* 27. Sides of dry, calcareous hills near the lower Rio Grande; *Schott.* Plains of Los Muros; *Bigelow.*

Oxalis Drummondii, *Gray, Pl. Wright.* 2, *p.* 25. O. vespertilionis, *Torr. & Gray, Fl.* 1, *p.* 679. Plains between the Leona and lower Rio Grande; also in Sonora, near the San Pedro river.

Oxalis violacea, *Linn.; Torr. & Gray, Pl.* 1, *p.* 211. Between the Pecos and Devil's river and the Rio Grande; Copper Mines, New Mexico; *Bigelow, Parry.* Usually taller than the eastern plant, but with smaller and more numerous flowers.

Oxalis Wrightii, *Gray, Pl. Wright.* 1, *p.* 27, *&* 2, *p.* 25. Near Rock Creek, and Presidio del Norte, July—August; *Bigelow.* Santa Cruz valley, Sonora; *Thurber.*

Oxalis decaphylla, *H. B. K.*; *Gray, l. c.* 2, *p.* 25. Copper Mines, New Mexico, August; *Bigelow.*

Oxalis stricta, *Linn.; Torr. Fl. N. York*, 1, *p.* 123. Rocks along the Leona and sandy banks of the lower Rio Grande, March—November.

GERANIACEÆ.

Geranium Carolinianum, *Linn.; Torr. & Gray, Fl.* 1, *p.* 207. Central and western Texas; also in Chihuahua and various parts of California.

Geranium cæspitosum, *James; Gray, Pl. Fendl. p.* 25. Organ mountains; *Bigelow.* Hills at the Copper Mines, June—August; *Bigelow, Thurber.* "Flowers usually purple, but sometimes quite white." *Thurber.*

Erodium Texanum, *Gray, Gen. Ill.* 2, *t.* 151. Northern New Mexico, western Texas and borders of the Gila.

Erodium cicutarium, *Herit.; DC. Prodr.* 1, *p.* 646. Common in New Mexico and throughout Sonora and California; probably introduced by the Spaniards.

Erodium macrophyllum, *Hook. & Arn. Bot. Beechey*, *p.* 327. California, (station not recorded,) *Parry.* The leaves in our specimens are much smaller than they are described by Hooker & Arnott, being scarcely more than an inch long.

LIMNANTHACEÆ.

LIMNANTHES DOUGLASII, *R. Br.; Torr. & Gray, Fl.* 1, *p.* 209, Benicia, California, March; *Thurber.*

ZYGOPHYLLACEÆ.

LARREA MEXICANA, *Moric.; Torr. in Emory's Rep., p.* 138, *t.* 3; *Gray, Gen. Ill. t.* 147. Along the boundary line from the Rio Grande to California.

PORLIERA ANGUSTIFOLIA, *Gray, Pl. Wright.* 2, *p.* 28. Guiacum angustifolium, *Engelm.* Plains near Eagle Pass, *Bigelow*, Deadman's Hole; *Parry.*

FAGONIA CALIFORNICA, *Benth. Bot. Sulph., p.* 10.; *Torr. in Pacif. R. R. Ex., Expe. pl.* 6, *p.* 359, *t.* 1. Rocky and hill sides of the lower Colorado, California, February; *Schott.*

GUIACUM COULTERI, *Gray, Pl. Thurb. p.* 312. Hills between Rayon and Ures, Sonora; *Thurber.*

KALLSTRŒMIA GRANDIFLORA, *Torr. in Gray, Pl. Wright.* 1, *p.* 26. Borders of the Rio Grande in western Texas; Chihuahua and Sonora, July. Mr. Schott states that it is called *Mal de Ojo* by the Sonorians.

KALLSTRŒMIA MAXIMA, *Torr. & Gray, Fl.* 1, *p.* 213. Common along the Rio Grande, and westward throughout the Mexican States and southern California.

RUTACEÆ.

KOEBERLINIA SPINOSA, *Zucc.; Gray, Pl. Wright.* 1, *p.* 30, & 2, *p.* 26. Rich soils in various places along the Rio Grande and in the Mexican States westward, May—August. "In favorable situations this shrub sometimes attains the height of 8 or 10 feet." *Thurber.*

PEGANUM MEXICANUM. *Gray, l. c.* 1, *p.* 30, *adnot.* Low places near the Eagle mountains, June; *Bigelow.* El Gallo, Chihuahua, November; *Thurber.*

THAMNOSMA TEXANUM. Rutosma Texanum, *Gray, Gen. Ill.* 2, *p.* 114, *t.* 155. Hills between the Pecos and Devil's river and the Rio Grande; also along the latter river from El Paso downward, and in western New Mexico, Sonora, etc., flowering throughout the season.

THAMNOSMA MONTANUM, *Torr. & Frem. in Frem. 2d Rep., p.* 313. Sierra Tule, Sonora; *Schott.* San Felipe, California, May; *Thurber.*

ASTROPHYLLUM DUMOSUM, *Torr. in Bot. Pope's Report, p.* 161. Mountains about thirty-five miles below El Paso, in Chihuahua, July (in fruit); *Bigelow.* Borders of the Rio Mimbres, *Dr. Henry*, United States army. Western slope of the Sierra del Pajarito, Sonora, July, (just past flowering,) *Schott*, (not on the Rio Grande, as erroneously stated in the Botany of Captain Pope's Report.) Since the description quoted above was written, other specimens of this remarkable plant have been received, but none of them with perfect flowers. In one or two instances withered, imperfect flowers were found, and we can now give a nearly complete character of the genus, which rather belongs to the Diosmeæ than to the true Rutaceæ.

ASTROPHYLLUM.

Calyx 4—5-sepalus, deciduus; sepalis obtusis. Petala 4—5, obovata. Stamina 8—10. Ovarium sessile, disco hypogyno 8—10-lobo insidens, 4—5-lobum, 4—5-loculare; loculis

2-ovulatis. Styli tot quot carpella, coaliti, demum inferne distincti. Stigma capitatum, 4—5-lobatum. Capsulæ abortu sepius 2, basi subcoalitae, sessiles, semibivalvia. Semina plerumque solitaria subglobosa. Frutex humilis, graveolens, ramosissimus; foliis oppositis petiolatis, palmatim 5—10-foliolatis; floribus albis in axillis summis solitariis vel subumbellatis.

A shrub 3 to 6 feet high, with numerous pubescent, crowded, opposite branches. Leaves opposite, (rarely sub-opposite), pubescent, exstipulate; petioles, 6—10 lines long; leaflets mostly longer than the petioles, marked (as are also the petioles and younger branches) with prominent conspicuous glands. In all the specimens from the Rio Grande there are 6 to 10 leaflets, which are narrowly linear (scarcely a line wide), and sub-coriaceous; in those from Sonora there are 5, which are twice as broad, and thinner. These glands, on the leaflets, are somewhat distant and marginal. Flowers perfect. Pedicels 8—10 lines long, mostly near the extremity of the branches, either solitary or 2 to 4, and somewhat umbellate. Sepals 4—5, short and semiovate, ciliate on the margin. Petals inserted at the base of the shorter stamens, 3—4 times as long as the calyx, obovate, narrowed at the base. Stamens mostly 8; filaments naked, the alternate ones longer, compressed; anthers ovate, fixed by the base, opening longitudinally. Disk produced into 8—10, nearly equal glaudular lobes, which are without pores. Ovary hairy, 4—5-lobed, 4—5-celled; the cells produced above into a short obtuse beak, exterior to the style; each cell containing 2 collateral hemitropous ovules. Styles short, at first combined, but afterwards (and especially in the unfructified ovaries) distinct below; stigma of 4—5 capitate lobes. Fruit capsular; only two of the carpels usually ripening; these are broadly ovate, compressed, dotted with brown impressed glands, mucronate with the base of the style; the beak, which in the ovary was at the summit of the carpel, becoming, in the mature fruit, a dorsal tooth. At maturity the carpels open nearly the whole length of the dorsal suture, and down the back as far as the tooth. The endocarp also separates almost entirely from the epicarp. Seeds mostly solitary in each cell, globose-ovate, black and shining. Embryo nearly straight in the axis of fleshy albumen; cotyledons roundish-ovate, flat, with a very short radicle. A very distinct genus.

PITAVIA (GASTROSTYLA) DUMOSA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 215. San Diego and San Pasqual, California, Febr.; Parry, *Thurber*. A shrub 2—3 feet high. Leaves pungent when chewed. Cymes 3-flowered, terminal, and on short lateral spurs. Calyx 4-parted; the segments ovate, acute, coriaceous. Petals white, equal, oblong, sparsely dotted. Stamens 8; filaments subulate; anthers somewhat reniform, innate, retrorse. Ovary solitary, seated on a fleshy sub-globose slightly lobed disk. Stigma capitate. Fruit 1—2-seeded, testa thick and coriaceous. Embryo curved, in rather thin fleshy albumen. This plant (as was remarked in the Flora of N. America) is hardly a congener of Pitavia. It may form a sub-genus, distinguished by its hermaphrodite flowers, solitary ovary, lateral style, and curved embryo.

ZANTHOXYLUM CAROLINIANUM, *Lam.; Torr. & Gray, Fl.* 1, *p.* 24. Var. foliis brevioribus ovatis, &c.; *Gray, Pl. Wright.* 1, *p.* 30. Head waters of the Nueces; also ravines on Devil's river and near Eagle Pass, Texas, March (in flower)—September (in fruit); *Bigelow*.

ZANTHOXYLUM PTEROTA. *H. B. Kth. Nov. Gen. & Sp.* 6, *p.* 3. Rocky places and hills near Santa Rosa, Cohahuila. February; *Bigelow*. Fort McIntosh, on the Rio Grande, May (fruit); *Schott*.

PTELEA TRIFOLIATA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 225, *and B. p.* 680. Rocky places, Frontera, Texas, and on the Mimbres, New Mexico; *Bigelow.* It is usually a shrub of from 3 to 6 feet high, but it sometimes occurs twenty feet.

PTELEA ANGUSTIFOLIA, *Benth. Pl. Hartw. p.* 9; *Gray. Pl. Fendl. p.* 28. Limestone hills around Ringgold Barracks; *Schott.* Mountain ravines, El Paso; *Thurber.*

COCHLOSPERMEÆ.

AMOREUXIA SCHEIDIANA, *Planch. in Hook. Lond. Jour. Bot.* 6, *p.* 140, *t.* 1; *Gray, Pl. Wright.* 2, *p.* 26, *t.* 12, *A.* Santa Cruz valley, Sonora; *Thurber.*

AMOREUXIA WRIGHTII, *Gray, l. c.* A. Scheidiana, *Pl. Wright.* 1, *p.* 29, *t.* 3. *B. excl. syn.* In rich soil, Eagle Pass, June; *Schott.* Hills and plains near the mouth of the Pecos, October (fruit); *Bigelow.*

ANACARDIACEÆ.

RHUS VIRENS, *Lindh. in Gray, Pl. Lindh.* 2, *p.* 159; *Pl. Wright.* 1, *p.* 31. Limestone rocks on Devil's river, and at the mouth of the Pecos; *Bigelow.*

RHUS MICROPHYLLA, *Engelm. in Gray, Pl. Wright.* 1, *p.* 31. Ravines along the Rio Grande, from El Paso down to Eagle Pass; also in Chihuahua and Sonora.

RHUS TRILOBATA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 219; *Gray, Pl. Wright.* 1, *p.* 31. Northern New Mexico and the Valley of the Rio Grande; also in Sonora and California. A form with the leaves velvety-pubescent occurs at the Copper Mines and on the Organ mountains, New Mexico.

RHUS COPALLINA, var. LANCEOLATA, *Gray, Pl. Lindh.* 2, *p.* 158. Hills and rocky places between the Limpia and the Rio Grande, July; *Bigelow.*

RHUS TOXICODENDRON, *Linn.; Torr. & Gray, l. c.* A variety with narrow leaves was found on the Sierra del Pajarito, Sonora, by *Schott;* and at the cañon of Guadaloupe, by Capt. E. K. Smith.

RHUS DIVERSILOBA, *Torr. & Gray, l. c.* R. lobata, *Hook. Fl. Bor.-Amer.* 1, *p.* 127, *t.* 46; *Lindl. Bot. Reg.* (*n. ser.*) 31, *t.* 38. In various parts of California; frequent.

PISTACIA MEXICANA, *H. B. K. Nov. Gen. & Sp.* 7, *p.* 22, *t.* 608. Rocky ravines near the mouth of the Pecos, western Texas, October (fruit); *Bigelow.* A small tree.

LITHRÆA LAURINA, *Walp. Repert.* 1, *p.* 550; *Torr. Pl. Whippl. l. c. p.* 73. Rhus (Malosma) laurina; *Nutt. in Torr. & Gray, Fl.* 1, *p.* 219. (TAB. VII.) San Diego, California; *Parry.*

STYPHONIA INTEGRIFOLIA, *Nutt. in Torr. & Gray, Fl. l. c. & Sylv.* 3, *p.* 4, *t.* 82; *Torr. in Pacif. R. Road Expl.* 7, *Bot. p.* 8, *t.* 2. Santa Barbara and San Diego, California; *Parry, Thurber.* Leaves very variable in size and outline, especially upon the young shoots. S. serrata (*Nutt.*) is not distinct.

SCHINUS MOLLE, *Linn. Sp. p.* 1467. Lower California, near the boundary line; *Parry;* and at the Mission of San Luis Rey; *Thurber.* It is common also in all the Mexican States, but is probably not indigenous. Mr. Thurber informs me that in California it is called Pepper Tree by the residents, the berries having precisely the taste of the common black pepper.

SIMARUBACEÆ.

CASTELA NICHOLSONI, *Hook. Bot. Misc.* 1, *p.* 271, *t.* 56; *Gray, Gen. Ill.* 2, *t.* 158. Dry plains and hills, western Texas, along the Rio Grande, February—March; *Parry, Thurber.* Mier Neuvo Leon; *Thurber.*

Holacantha Emoryi, *Gray, Pl. Thurber. p.* 310. (Tab. VIII.) Near Sonoita, Sonora, August (with fine fruit); *Schott.* The description of this remarkable plant, by Dr. Gray, is so complete and so accurate that I have nothing to add but a good figure by Sprague.

VITACEÆ.

Vitis bipinnata, *Torr. & Gray, Fl.* 1, *p.* 243. Banks of Escondida creek, near Eagle Pass, and at Rock creek, western Texas, July—September (in fruit); *Bigelow.*

Vitis incisa, *Nutt. in Torr. & Gray, l. c.* On the lower Rio Grande, and in Cocospera valley, Santa Magdalena, Sonora; *Schott.* "It is mixed with cochineal and used by the Mexicans to dye red."

Vitis æstivalis, *Fl.* 2, *p.* 230; *Torr. & Gray, l. c.* Central Texas; *Wright.* On Mount Ben Moore, New Mexico; *Bigelow.*

Vitis Californica, *Benth. Bot. Sulph, p.* 10. San Diego and other parts of California, July; *Parry.* Sonora; *Thurber, Capt. E. K. Smith.*

Ampelopsis quinquefolia, *Michx. Fl.* 1, *p.* 159. On the Mimbres and at the Copper Mines, New Mexico, June—July; *Bigelow.*

RHAMNACEÆ.

Adolphia infesta, *Meisn. Gen. p.* 70; *Gray, Pl. Wright.* 1, *p.* 34. Monterey and near San Diego, California, March—May; *Parry.* Hills near Rock creek, Texas; July (flowers and fruit); *Bigelow, Parry.*

Ceanothus Greggii, *Gray, Pl. Wright.* 2, *p.* 28. Guadaloupe Pass; April; Sonora; *Parry;* and San Luis mountains in the same State; *Capt. E. K. Smith.*

Ceanothus ovalis, *Torr. & Gray, Fl.* 1, *p.* 265. Dry ravines, valley of the Pecos, Texas, and San Felipe; *Bigelow.*

Ceanothus divaricatus, *Nutt. in Torr. & Gray, l. c.*, var. eglandulosus, *Torr. in Bot. Whipp. Rep. l. c. p.* 75. Mountains eastof San Diego, California, June (fruit); *Parry.*

Ceanothus sorediacus, *Hook. & Arn. Bot. Beechey, p.* 329; *Torr. & Gray, l. c.* On the conglomerate and sandstone hills above San Diego; *Parry.* C. Lobbianus, *Hook. Bot. Mag. t.* 4811, seems to be hardly distinct from our plant.

Ceanothus thyrsiflorus, *Eschsch. in Mem. Acad. St. Petersb.* 1826; *Torr. & Gray, Fl. l. c.* Common in the neighborhood of Monterey and San Diego, as well as in many other parts of California, where it is known by the name of California lilac.

Ceanothus spinosus, *Nutt. l. c.* Near Santa Barbara, California; March; *Parry,* Flowers white, with a tinge of blue. Leaves sometimes distinctly toothed at the apex. The branches are not thorny in our specimens.

Ceanothus cuneatus, *Nutt. l. c.* C. macrocarpus, *Nutt. l. c.* Near San Luis Obispo and Santa Barbara, California, April; *Parry.* There can be no doubt of the propriety of uniting the two species here quoted. We have specimens collected from numerous localities, which show a transition from the one to the other.

Ceanothus rigidus, *Nutt. l. c.; Benth. Pl. Hartw. p.* 302; *Lindl. & Paxt. Fl. Gard.* 1, *p.* 74, *t.* 51. (Table IX.) On dry hills, Monterey, California, April; *Parry.* An evergreen shrub about 5 feet high, with rigid branches. The leaves vary greatly in form, being sometimes broadly obovate and often deeply emarginate.

CEANOTHUS DENTATUS, *Torr. & Gray, Fl. l. c.; Lindl. & Paxt. Fl. Gard.* 1, *p.* 17, *t.* 4. (TABLE X.) Sandy soils around Monterey, California; *Parry.* A low bush. Our specimens correspond with Douglas's plant, except that in the latter the flowers are said to be white, whereas they are blue in the former. They had, no doubt, faded in the specimens from which the original description was drawn.

CEANOTHUS CRASSIFOLIUS, (n. sp.): fruticosus, erectus; ramulis teretibus albo-tomentosis; foliis ovatis obtusiusculis integerrimis crassis penninerviis subtus dense albo-tomentosis glabris minute papillaris opacis; thyrsis subsessilibus brevibus subumbelliformibus densifloris. (TABLE XI.) Mountains south of Los Angelos, February; *Parry.* A shrub 4 to 5 feet high, much branched. Leaves 1—1¼ inch long, remarkably thick and coriaceous, revolute on the margin when dry, pale dull green above and appearing rough like shagreen under a lens; petiole 2—3 lines long, thick. Clusters of flowers terminal, and in the axils of the upper leaves. Calyx and corolla white. Ovary marked with 3 minute protuberances. Fruit not known.

FRANGULA CAROLINIANA, *Gray, Gen. Ill.* 2, *p.* 178, *t.* 167. Rhamnus Carolinianus, *Walt. Fl. Car. p.* 101. Banks of streams, Los Muros, &c., Western Texas; *Bigelow.*

FRANGULA CALIFORNICA, *Gray, l. c., & Pl. Wright.* 2, *p.* 28. Mountain ravines near Camp Bache, Western Texas; *Bigelow.* Sonora; *Schott, Capt. E. K. Smith.* Monterey and San Diego, California; *Parry.* Variable in the form and pubescence of the leaves. We quite agree with Dr. Gray, that this species includes Rhamnus Californicus, *Esch.*, R. oleifolius, *Hook.*, R. laurifolius, *Nutt.* R. leucodermis, *Nutt.*, and R. tomentellus, *Benth.*

RHAMNUS CROCEUS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 261. Around Monterey and San Diego, also on the mountains of southern California; *Parry.* The leaves vary from ½ to 1½ inch in length, and from obovate-oblong to broadly ovate. The under surface is always yellowish. The fruit in Dr. Parry's specimens is all 2-seeded.

ZIZYPHUS PARRYI, (n. sp.): glabra; ramis spinosis; foliis obovatis integerrimis sub-coriaceis penninerviis; pedunculis unifloris, fructiferis recurvis; drupa sub-exsucca ovata apiculata 3-loculare; nuce crassissima ossea 3-loculari 3-sperma. Gravelly ravines near San Felipe, California, June (in fruit); *Parry.* It was afterwards found at the same place by Mr. Thurber. A shrub 4—6 feet high, much branched; the branches smooth, flexuous, and armed with numerous slender leafy spines. Leaves 8—12 lines long, obtuse or sometimes retuse, abruptly tapering at the base into a short petiole; stipules minute, subulate, deciduous. Only a solitary flower was found. This was minute and pentamerous, the very small concave petals partly embracing the stamens. Peduncles solitary, or sometimes 2—3 together, arising from short branches or spurs; those of the fruit about half an inch long and recurved. Drupes 6—8 lines long, with a short abrupt point, lemon yellow, the pulp very thin. Nutshell extremely thick and hard. Seeds narrowly oblong. Albumen very thin. Embryo linear, oblong, green. This must be a very rare plant, as it has been found but twice, and in both cases near the same spot. In its nearly dry 3-celled fruit and extremely thick shell it resembles Z. xylopyra of India.

ZIZYPHUS OBTUSIFOLIA, *Gray, Gen. Ill.* 2, *p.* 170, *t.* 163; *& Pl. Lindh.* 2, *p.* 168. Dry hills and banks from El Paso to Eagle Pass, on the Rio Grande; March—June; abundant.

ZIZYPHUS LYCIOIDES, *Gray, l. c.* Near Elceario, on the Rio Grande, June (in fruit); *Parry.* Valley of the Gila; *Thurber.* Dr. Gregg found it between Matamoras and Mapini. The fruit is black and somewhat astringent, but edible.

Condalia spathulata, *Gray, Pl. Wright.* 1, *p.* 32. Ravines on the Rio Concha; *Bigelow.* Eagle Pass, Texas, and Sonora; *Schott.*

Condalia obovata, *Hook. Ic. t.* 287; *Torr. & Gray, Fl.* 1, *p.* 685; *Gray, Gen. Ill.* 2, *t.* 164. Sandy plains, Eagle Pass, and upward to El Paso, April; *Bigelow.* Tucson, Sonora; *Parry.*

Colubrinia Texensis, *Gray, Pl. Lindh.* 2, *p.* 169; *Pl. Wright.* 1, *p.* 33. Plains between the Pecos and the Rio Grande. The leaves on the young shoots are sometimes 4 inches long and 3 inches wide, but on the older branches they are much shorter.

Karwinskia Humboldtiana, *Zucc.; Gray, Pl. Wright.* 1, *p.* 72. Between the Rio Grande and the Pecos and Devil's river; May—July.

CELASTRACEÆ.

Mortonia spabrella, *Gray, Pl. Wright.* 2, *p.* 28. Mountains of El Paso and of Chihuahua, opposite San Elceario, May—June; *Parry, Bigelow.*

Mortonia sempervirens, *Gray, Pl. Wright.* 1, *p.* 35, *t.* 4. On the Pecos, western Texas.

Mortonia Greggii, *Gray, l. c.* (*adnot.*) Calcareous hills, Ringgold Barracks, May; *Schott.*

Glossopetalon spinescens, *Gray, Pl. Wright.* 2, *p.* 29, *t.* 12. *B.* Mountains and rocky places, El Paso, March; *Bigelow.*

Maytenus phyllanthoides, *Benth. Bot. Sulph. p.* 54. Lower Rio Grande (in fruit); *Schott.* A native also of the bay of Magdalena, California, and of Key West, Florida. Cotyledons thick, and albumen very thin in this species.

Pachystima myrsinites, *Raf.; Gray, Pl. Fendl. p.* 29. Sides of Ben More, New Mexico, June; *Bigelow.*

Schæfferia cuneifolia, *Gray, Pl. Wright.* 1, *p.* 35. Western Texas, along the lower Rio Grande, March (male flowers); *Schott.*

ACERACEÆ.

Acer macrophyllum, *Pursh, Fl.* 1, *p.* 267; *Hook. Fl. Bor.-Am.* 1, *p.* 112, *t.* 38. Mountain ravines, Santa Barbara, California; *Parry.*

Negundo aceroides, *Moench*; *Torr. & Gray, Fl.* 1, *p.* 260. N. Californicum, *Torr. & Gray, l. c. Nutt. Sylv.* 2, *p.* 90, *t.* 72. In various parts of California; *Parry.*

SAPINDACEÆ.

Sapindus marginatus, *Willd; Gray, Gen. Ill.* 2, *t.* 150. Along the Rio Grande and its tributaries; also near the Copper Mines, New Mexico, and in Sonora.

Cardiospermum Halicacabum, *Linn.* Western Texas, and on the lower Rio Grande; *Schott.*

Serjania incisa, (n. sp.) foliis impari-bipinnatis; pinnis bijugis trifoliatis; foliolis ovato-rhomboideis serrato-incisis utrinque pubescentibus, petiolis subalatis; carpellorum alis semi-oblongis. Mountains of Santa Rosa, Cohahuila; *Bigelow.* A vine 3—8 feet long. Leaflets 1—1½ inch long, acute at each end, with 2—3 coarse teeth on each side; the petiole more or less distinctly winged. Peduncles about two-thirds the length of the leaves. Panicle an inch or more long, racemiform, usually with 2 or 3 tendrils at the base. Sepals oblong. Petals strongly appendiculate on the inside. Fruit 1½ inch long, at first pubescent, but nearly smooth when old; seed-bearing portion reticulately veined; wings 3—5 lines wide, rather obtuse at the base. We think this can hardly be S. racemosa, nor can we refer it to any described species of Serjania. The leaves in all our specimens are pinnate, and the pinnæ trifoliate.

URVILLEA MEXICANA, *Gray, l. c. (adnot.)* Rich soil, among rocks. Monterey, Neuvo Leon, *Thurber*. It was found some years before, in the same place, by Dr. Gregg, Dr. Edwards, and Major Eaton. Taumilapas; *Berlandier*, No. 2269.

DODONÆA SCHEIDIANA, *Schlecht. in Linnœa*, 18, *p.* 49. In various parts of Sonora; *Thurber, Schott.*

ÆSCULUS CALIFORNICA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 251, *& Sylva*, 2, *p.* 69, *t.* 74. *Newberry, Bot. Williamson in Pacif. R Road Expl.* 6, *p.* 21, *fig.* 1. Near Mônterey and San Luis Obispo, California, May; *Parry.*

UNGNADIA SPECIOSA, *Endl. Atakt. t.* 36; *Gray, Gen. Ill.* 2, *t.* 178 *&* 179. Dry ravines, Organ mountains of New Mexico, March—April; *Bigelow.* Hueco mountains, Texas; *Thurber.*

MALPIGHIACEÆ.

GALPHIMIA LINIFOLIA, *Gray, Gen. Ill.* 2, *p.* 196, *t.* 173. Limestone hills and plains on the Rio Grande and its tributaries, western Texas.

MALPIGHIA GLABRA, *Linn.; DC. Prodr.* 1, *p.* 578. On the lower Rio Grande, September—October (flowers and fruit); *Schott.* Dr. Edwards found it near Monterey, Neuvo Leon. It is a shrub 1—4 feet high, growing in densely bushy places.

JANUSIA GRACILIS, *Gray, Pl. Wright.* 1, *p.* 38; *&* 2, *p.* 30; *Torr. Bot. Parkes, in Pacific R. Road Expl.* 7, *p.* 9, *t.* 1. From the Limpio mountains to El Paso, and west to Chihuahua and Sonora.

ASPICARPA LONGIPES, *Gray, Pl. Wright.* 1, *p.* 38 *&* 2, *p.* 30. Rocky hills near the Limpia river, July—September; *Bigelow.* Sierra del Pajarito, Santa Cruz, Sonora; *Thurber, Schott.*

ASPICARPA HYSSOPIFOLIA, *Gray, Pl. Lindh.* 2, *p.* 167; *& Pl. Wright.* 1, *p.* 36. Limestone hills along the lower Rio Grande, October; *Schott.*

HIRÆA SEPTENTRIONALIS, *Ad. Juss. Monog. Malpigh. p.* 309. Var. foliis minoribussæ pissime oblongo-lanceolatis, *Gray, Pl. Thurb. p.* 303 *(adnot.)* Between Reyon and Ures, Sonora; *Thurber.* Dr. Edwards collected it near Monterey, Neuvo Leon. It is a shrub 6—8 feet high.

POLYGALACEÆ.

POLYGALA PUBERULA, *Gray, Pl. Wright.* 2, *p.* 30. Hills between Van Horn's Wells and Muerte; and on the mountains of Leona; June—August; also at the Copper Mines, and on the Rio Mimbres.

POLYGALA LINDHEIMERI, *Gray, pl. Lindh.* 2, *p.* 150; *& Pl. Wright.* 1, *p.* 39. Hills and plains, western Texas; New Mexico and Sonora; June—September.

POLYGALA OVATIFOLIA, *Gray, Pl. Wright.* 1, *p.* 39. Limestone rocks on the Rio Grande from Eagle Pass up to the San Pedro and Pecos; *Schott, Bigelow.*

POLYGALA ALBA, *Nutt. Gen.* 2, *p.* 87; *Gray, Pl. Wright. l. c.* Gravelly hills on the Rio Grande from New Mexico to the lower river. Valley of the Santa Cruz river, Sonora; *Capt. E. K. Smith.*

POLYGALA SCOPARIA, *H. B. K. Nov. Gen.* 5, *p.* 399; var. MULTICAULIS, *Gray, l. c.* Hills and ravines at El Paso; also at Eagle Springs, Texas; *Bigelow, Parry.*

Polygala hemipterocarpa, *Gray, Pl. Wright.* 2, *p.* 31. Rocky hills near Camp Bache, Texas, July; *Bigelow.* Sierra del Pajarito; *Schott.*

Polygala macradenia, *Gray, l. c.* 1, *p.* 39. Hills on the Rio Grande, from El Paso to Eagle Pass; June.

Polygala Nutkana, *Moc. & Sessé; DC. Prodr.* 1, *p.* 331. P. cucullata, *Benth. Pl. Hartw. p.* 229. P. Californica, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 671. (Tab. XII) Near Monterey, May; *Parry.* We have seen specimens of this plant with radical flowers, so that no doubt Nuttall's P. Californica is the same as P. Nutkana.

Monnina Wrightii, *Gray, l. c.* 2, *p.* 31. Copper Mines, New Mexico, Aug.; *Bigelow.*

KRAMERIACEÆ.

Krameria lanceolata, *Torr. in Ann. Lyc. N. York,* 2, *p.* 168; *Gray, Gen. Ill.* 2, *t.* 185. Hill-sides along the Rio Grande, from El Paso to Laredo, April—July. Cañon of Guadaloupe, Sonora; *Capt. E. K. Smith.*

Krameria parvifolia, *Benth. Bot. Sulph. p.* 6, *t.* 1; *Gray, Pl. Wright.* 1, *p.* 42. Ravines and hills, western Texas, particularly along the upper Rio Grande and at Guadaloupe cañon, Sonora; *Capt. E. K. Smith;* also on the border of the California desert, near San Felipe, June; *Parry.* Var. ramosissima, *Gray, l. c.* Devil's river, Leon Springs, and Presidio del Norte.

Krameria canescens, *Gray, Pl. Wright. l. c.* (Tab. XIII.) Hills on the Rio Grande, from El Paso to the mouth of the Cibolo, June—July; *Bigelow.*

LEGUMINOSÆ.

Vicia pulchella, *H. B. K.*; Var. foliolis majoribus, etc., *Gray, Pl. Wright.* 2, *p.* 32. Hills at the Copper Mines, New Mexico, August; *Bigelow.*

Vicia exigua, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 272. Hill-sides, southern New Mexico, Chihuahua, and southern California, April—June.

Lathyrus linearis, *Nutt. l. c.* On the Rio Mimbres and at the Copper Mines, New Mexico, June, (in flower and fruit;) *Bigelow.*

Lathyrus vestitus, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 276. Napa county, California, March; *Thurber.*

Lathyrus palustris, *Linn.* var.? foliis elongatis angustis, etc.; *Gray, Pl. Wright.* 2, *p.* 32. Western Texas, and at the Copper Mines; also in Cohahuila and Sonora.

Lathyrus polymorphus, *Nutt. Gen.* 2, *p.* 97. In wet places, Sonora; *Thurber.*

Lathyrus venosus, *Muhl. in Willd. Sp.* 3, *p.* 1092? In shady places near San Diego, California, May; *Thurber.* A form with emarginate leaflets.

Lathyrus maritimus, *Bigel. Fl. Bost. ed.* 2, *p.* 268; *Torr. & Gray, Fl.* 1, *p.* 273. Near San Diego, March; *Parry.* Peduncles, petioles, and calyx pubescent. Leaflets 8—12, mostly alternate, varying from ovate to elliptical-oblong, glabrous, scarcely half as large as in the eastern plant. Stipules broadly cordate-hastate, nearly as long as the leaflets. Peduncles 6—10-flowered.

Phaseolus retusus, *Benth. Pl. Hartw. p.* 11; *Gray, Pl. Lindh.* 2, *p.* 170. Valley of the Limpio, and near the Copper Mines, July—August; *Parry, Bigelow.*

Phaseolus Wrightii, *Gray, Pl. Wright.* 1, *p.* 43. Mountains and rocky places along the middle Rio Grande, and at the Copper Mines, July—August. Dr. Bigelow found at Eagle Pass what seems to be a variety of this species, in which the leaflets of the lower leaves are entire.

PHASEOLUS ANGUSTISSIMUS, *Gray, Pl. Wright.* 2, *p.* 33. Dry ravines on the Cibolo, a tributary of the Rio Grande, Cohahuila, July; *Bigelow.*

PHASEOLUS, MACROPOIDES, *Gray, l. c.* Hills at the Copper Mines, August; *Bigelow.*

PHASEOLUS ATROPURPUREUS (n. sp.:) caulibus volubilibus retrorsim pubescentibus; stipulis minutis subulatis; foliolis lanceolatis basi dilatatis utrinque pubescentibus lateralibus ad basim unilobatis, terminati trilobo; pedunculis folio multoties longioribus paucifloris; calycibus subsessilibus, laciniis inferioribus lanceolato-subulatis, superioribus triangulari-lanceolatis, alis corollæ late ovatis (atropurpureis) vexillo duplo longioribus; leguminibus deflexis lineari-falcatis 7—9-spermis. Rocks on the Rio Cibolo of the Rio Grande, and ravines, Bufitillo; *Bigelow.* Presidio del Norte, July—August; *Parry.* Leaflets 1½—2½ inches long, tapering to a long narrow point; the lateral ones with large acute lobe on the outer side at the base; the terminal leaf more or less dilated at the base, and usually 3-lobed, but sometimes (especially in the lower leaves) only obscurely lobed. Peduncle 8—12 inches long, and still more elongated in fruit. Flowers 6—10, at first approximated toward the extremity of the peduncle, but afterwards distant. Pods about 3 inches long and 2 lines wide. Seeds oblong, compressed, about 2½ lines long, and 1½ wide; smooth, greyish, speckled with dark purple. This seems to be quite distinct from any Phaseolus hitherto described. Mr. Schott found on the sea beach at Brazos Santiago, Texas, a plant allied to this, but much more downy, and the leaflets half as large, ovate, obtuse, with very short lobes. The specimens are not sufficiently complete for a more minute comparison.

VIGNA VILLOSA, *Savi.? DC. Prodr. l.* 2, *p.* 40. Thickets on the Rio Grande, between Ringgold Barracks and Laredo; *Schott.* If, as is probable, this and V. glabra are not specifically distinct, it ought to be called V. luteola, the genus Vigna having been founded on Dolichos luteolus, *Jacq.*

ERYTHRINA CORALLOIDES, *Moc. & Sesse in DC. Prodr.* 2, *p.* 413? *Gray, Pl. Thurb. p.* 301. Bachuachi and Gaudaloupe cañon, June (in flower) and August (in fruit); *Thurber.* Summit of mountains north of Imores; *Capt. E. K. Smith;* and Sierra del Pajarito, in the same State; *Schott.* I have followed Dr. Gray in naming this plant, but it does not well accord with the description of De Candolle. The leaves are broader than long, and the petioles in our specimens are more or less prickly. Indeed, it scarcely differs from E. herbacea, of the southern States, for that species becomes shrubby in Florida, and the stem, as well as the petioles, prickly.

RHYNCHOSIA TEXANA, *Torr. & Gray, Fl.* 1, *p.* 687. Western Texas; also near the Copper Mines and Sonora, May—June.

RHYNCHOSIA TEXANA, var. ANGUSTIFOLIA, *Gray, Pl. Wright.* 1, *p.* 44. Mountain ravines, between Van Horn's Wells and Muerte, July; *Parry, Bigelow.*

RHYNCHOSIA MENISPERMOIDEA, *DC. Prodr.* 2, *p.* 384. Sandy places, low land, Texas, June; *Thurber, Bigelow.*

CENTROSÆMA VIRGINIANA, *Benth.; Torr. & Gray, Fl.* 1, *p.* 290. Var. foliolis minoribus angustioribusque. Brazos Santiago, May; *Schott.*

GALACTIA MARGINALIS, *Benth.; Torr. & Gray, Fl.* 1, *p.* 288. Western Texas, near the Rio Grande; *Parry.*

GALACTIA TEPHRODES, *H. B. Kth.; Gray, Pl. Wright.* 2, *p.* 34. Ravines near Rock creek; *Bigelow.* Janos, Chihuahua; *Thurber.*

GALACTIA CANESCENS, *Benth.; Torr. & Gray, Fl.* 1, *p.* 288. Sandy places between Ringgold Barracks and Laredo, Texas; *Schott.*

Galactia Wrightii, *Gray, Pl. Wright.* 1, *p.* 44. Sierra del Pajarito, July; *Schott.*

Cologania pulchella, *H. B. Kth.; Gray, l. c. p.* 45, *&* 2, *p.* 34. Ravines near the Copper Mines; rocky hills near Muerte, and mountains of Muerte, July—August; *Bigelow.*

Cologania longifolia, *Gray, l. c.* 2, *p.* 35. Ravines near Camp Bache, western Texas, and at the Copper Mines; *Bigelow.* A large leaved form.

Daubentonia longifolia, *DC. Mem. Leg. & Prodr.* 2, *p.* 267; *Torr. & Gray, Fl. p.* 283. Banks of the Rio Grande from Laredo down to the coast; *Schott.* Rio Coleto, Texas; *Thurber.* A large shrub, with showy racemes of bright yellow flowers. The seeds are used as a substitute for coffee.

Daubentonia? Thurberi, *Gray, Pl. Thurb. p.* 313. Hill-sides, Mabibi, Sonora, June; *Thurber.*

Glottidium floridanum, *DC. Prodr.* 2, *p.* 266; *Torr. & Gray, Fl.* 1, *p.* 294. Southwestern Texas, September; *Thurber.*

Sesbania macrocarpa, *Muhl.; DC. l. c.; Torr. & Gray, l. c.* Shore of the lower Gila, near its confluence with the Colorado; *Schott.* Cocospera, Sonora; *Thurber.*

Peteria scoparia, *Gray, Pl. Wright.* 1, *p.* 50. Gravelly hills near Rock creek, and between Van Horn's Mills and Eagle Springs, between the Pecos and the Rio Grande, July, *Bigelow.*

Pickeringia montana, *Nutt. in Torr. and Gray, Fl.* 1, *p.* 389.—(Tab. XIV.) Hills near Monterey, May; *Parry.* The fruit of this interesting shrub is still a desideratum.

Tephrosia Lindheimeri, *Gray, Pl. Lindheim.* 2, *p.* 172. Hills on the Lower Rio Grande, April; *Schott.*

Tephrosia leucantha, *H. B. K.? Gray, Pl. Wright.* 2, *p.* 36. Santa Cruz and Mabibi, Sonora; September (in fruit); *Thurber.* Sierra Verde, in the same State; *Schott.*

Tephrosia tenella, *Gray, l. c.* Santa Cruz, September; *Thurber,* and Sierra de la Union; Sonora, July; *Schott.*

Indigofera Lindheimeriana, *Scheele in Linnœa,* 21, *p.* 464; *Gray, Pl. Wright.* 1, *p.* 45. Central and western Texas, August—September.

Indigofera leptosepala, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 298. Valley of the Pecos, &c.; September.

Psoralea floribunda, *Nutt. l. c. p.* 30. Gravelly hills, Rock creek, and at the Copper Mines; also in Sonora, south of the boundary line.

Psoralea esculenta, *Pursh, Fl.* 2, *p.* 475, *t.* 22. Fields near the Presidio del Norte, August; *Parry.* Luxuriant specimens, with the leaves all crisped, undulate on the margin.

Psoralea orbicularis, *Lindl. Bot. Reg. t.* 1971; *Torr. & Gray, Fl.* 1, *p.* 304. Near San Luis Obispo and other parts of California, April; *Parry.* Peduncles often more than a foot long, and the petioles of nearly the same length. The spike is at first short and capitate, but in full flower is sometimes 6 inches long.

Psoralea macrostachya, *DC. Prodr.* 2, *p.* 220; *Torr. & Gray, Fl.* 1, *p.* 689. Banks of rivers, San Luis Rey, California, October; *Parry.*

Psoralea psycodes, *Dougl. in Hook. Fl. Bor.-Am.* 1, *p.* 136. In moist places near Monterey, California, May; *Parry.* Our specimens accord exactly with Douglas' Californian plant, and therefore belong to the var. *β. Hook. l. c.*

Eysenhardtia amorphoides, *H. B. K. Nov. Gen. & Sp.* 6, *p.* 489, *t.* 592. Common in western Texas, along the Rio Grande, also in Cohahuila, Chihuahua, and Sonora, May—September.

DALEA FORMOSA, *Torr. in Ann. Lyc. N. Y.* 2, *p.* 178; *& in Emory Rep. t.* 1. Gravelly and rocky hills and prairies along the Rio Grande, from Frontera down to Eagle Pass, also in Cohahuila, April—July. A highly ornamental little shrub, bearing a profusion of bright rose-colored flowers.

DALEA POGONATHERA, *Gray, Pl. Wright.* 1, *p.* 48. Hills along the Rio Grande and its tributaries in western Texas and the Mexican States, April—August.

DALEA LASIATHERA, *Gray, l. c.* Plains near Howard's Springs, September; *Bigelow.* Central Texas; *Thurber.*

DALEA BRACHYSTACHYXS, *Gray, l. c.* 2, *p.* 39. Plains, Leon Springs, September; *Bigelow.* Sonora; *Thurber.*

DALEA POLYGONOIDES, *Gray, l. c.* Hills near the Copper Mines, New Mexico, October; *Bigelow.*

DALEA FILIFORMIS, *Gray, l. c.* With the last; *Bigelow.* Also between Janos and Santa Maria river, Sonora, September; *Schott.*

DALEA LÆVIGATA, *Gray, l. c.* With the last; *Bigelow, Thurber.* Dry rocky places, valley of the Santa Cruz, Sonora; *Captain E. K. Smith.*

DALEA ALBIFLORA, *Gray, l. c. p.* 38. Hills near the Copper Mines, August—October; *Bigelow.* San Pedro, Sonora; *Thurber.*

DALEA ALOPECUROIDES, *Willd.; Gray, Pl. Fendl. p.* 31. Santa Cruz, Sonora, May—September; *Thurber, Captain E. K. Smith.*

DALEA WISLIZENI, *Gray, Pl. Fendl. p.* 32, *& Pl. Wright.* 2, *p.* 38. Santa Cruz, Sonora, September; *Thurber.*

DALEA AUREA, *Nutt. Gen.* 2, *p.* 101. Dry rocky places in the valley of the Limpio, July; *Bigelow.* Arroyo los Moros, on the Rio Grande, August; *Schott.*

DALEA NANA, *Torr. in Pl. Fendl. p.* 31; var. elatior, &c. *Gray, Pl. Wright.* 1, *p.* 46. Hills along the Rio Grande and its tributaries from New Mexico to Laredo, June—August.

DALEA WRIGHTII, *Gray, Pl. Wright.* 1, *p.* 49. Hill sides Frontera, and between the San Pedro and Pecos, May—October. Cañon of the Guadaloupe river, Sonora, April; *Capt. E. K. Smith.*

DALEA JAMESII, *Torr. & Gray, Fl.* 1, *p.* 308. Gravelly hills, Rock Creek, and plains along the Limpio, May--July; *Bigelow.* Mule Springs, New Mexico; *Thurber.*

DALEA LACHNOSTACHYS, *Gray, Pl. Wright.* 1, *p.* 46. With the last; *Parry, Bigelow.*

DALEA MOLLIS, *Benth. Pl. Hartw. p.* 306. Hills and rocky places along the Rio Grande, Texas, westward to the Colorado desert, California; February—July.

DALEA LANATA, *Spreng. Syst.* 3, *p.* 327. Sandy ravines and hill sides on the Rio Grande, Texas; also in Cohahuila and Chihuahua, September.

DALEA ARGYRÆA, *Gray, Pl. Wright.* 1, *p.* 47. Rocky hills between the Nueces and the Rio Grande, September.

DALEA GREGGII, *Gray, Pl. Thurb. p.* 315. Agua Prieta, March; *Parry.* Cerro Gordo, in Durango; *Thurber.* Sierra del Pajarito, Sonora, July; *Schott.* Leaflets sometimes only 3. Flowers bright rose color.

DALEA EMORYI, *Gray, l. c.; Torr. in Pacif. R. Road Expl.* 6, *p.* 360, *t.* 11. Valley of the Gila, May—July; *Schott, Thurber.*

DALEA SCOPARIA, *Gray, Pl. Fendl. p.* 32, *& Pl. Wright.* 1, *p.* 47. Sandy hills near Elceario, June; *Bigelow.* Laguna de los Patos, Chihuahua; *Thurber.*

DALEA FRUTESCENS, *Gray, Pl. Lindh.* 2, *p.* 175. Hills and rocky places along the Rio Grande and its tributaries, August—September.

DALEA SPINOSA, *Gray, Pl. Thurb. p.* 315; *Torr. Bot. Parke, in Pacif. R. Road Expl.* 7, *p.* 9, *t.* 3. On the lower Rio Gila; *Thurber.* Dry beds of rivers in the Californian desert; *Schott.* The leaves of young shoots and seedlings are obovate-oblong, toothed and dotted with glands.

DALEA SCHOTTII (n. sp.): fruticosa; ramis flexuosis glaberrimis, ramulis in spinas subpungentes abuentibus; foliis simplicissimus sparsis anguste linearibus; pedunculis 2–3–floris; calycis dentibus late ovatis tubo glabro eglanduloso duplo brevioribus; corolla violacea. Diluvial banks of the Colorado, February; *Schott.* Branches zigzag, smooth, yellow. Leaves 8–10 lines long, scarcely a line wide, hoary-pubescent above, green, and marked with row of impressed dots on each side underneath. Flowers produced at the extremity of short branches, usually two together, on short pedicels; the bracts resembling the leaves, only smaller. Calyx without glands, somewhat turbinate, smooth, the broad teeth pubescent on the margin. Corolla deep violet. Pods not seen.

PETALOSTEMON EXILE, *Gray, Pl. Wright.* 2, *p.* 51. Hills and rocky places at the Copper Mines, New Mexico, September; *Bigelow.* Santa Cruz, Sonora; *Thurber.*

PETALOSTEMON CANDIDUM, *Michx. Fl.* 2, *p.* 49, *t.* 37, *f.* 1. Near the Copper Mines, and low places between Van Horn's Wells and Muerte, July; *Bigelow.* Rio de Sta. Cruz and Prodrero, Sonora, June; *Schott.* Our plant resembles Fendler's specimens named P. gracile by Dr. Gray, but it is erect.

PETALOSTEMON EMARGINATUM, *Torr. & Gray, Fl.* 1, *p.* 311. Near Ringgold Barracks; *Schott.* We have never before received specimens of this plant since it was sent to us from Drummond's Texan collection.

ROBINIA NEO-MEXICANA, *Gray, Pl. Thurb. p.* 315. Along the Mimbres, New Mexico; *Thurber,* and on Ben Moore, near the Copper Mines; *Bigelow.*

AMORPHA LAEVIGATA, *Nutt.* var. PUBESCENS, *Gray, Pl. Wright.* 1, *p.* 49. Hills at the Copper Mines, and on the Rio Grande below the mouth of Escondido creek, March; *Bigelow, Schott.* Hardly distinct from the next.

AMORPHA FRUTICOSA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 305. A. Californica, *Nutt. l. c.* Mountains east of San Diego, California; *Parry.* Mabibi, Sonora, June; *Thurber.* I can find no reliable characters for distinguishing the two species here united. Mr. Nuttall's plant was described from specimens in which the flowers were scarcely unfolded, and the fruit of which was not collected.

GLYCYRRHIZA LEPIDOTA, *Nutt. Gen.* 2, *p.* 106; *Bot. Mag. t.* 2150; *Gray, Pl. Wright.* 1, *p.* 50. G. glutinosa, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 298. Valley of the Rio Grande below San Elceario, June; *Thurber.* Ojo de Vaca, Chihuahua; *Thurber.* San Felipe, California; *Parry.*

MEDICAGO SATIVA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 321. Banks of the acequia, near El Paso, May; *Bigelow.* This is no doubt an introduced plant. It seems to be naturalized in many parts of the Mexican States.

MEDICAGO DENTICULATA, *Willd.; Torr. & Gray, l. c.* Naturalized in western Texas, New Mexico and the Mexican States west of the Rio Grande; also throughout California, wherever the Spanish missions were established.

MELILOTUS PARVIFLORA, *Desf.; Torr. & Gray, l. c.* M. occidentalis, *Nutt. l. c.* Western Texas, Chihuahua, Sonora and California, April—May. Introduced from Europe.

TRIFOLIUM FIMBRIATUM, *Lindl. Bot. Reg. t.* 1070*; Torr. & Gray, Fl.* 1, *p.* 317. Near San Diego, California, May; *Parry.* Napa and San Isabel in the same State; *Thurber.* All our specimens of this plant are clothed with a minute glandular pubescence. The leaflets are lanceolate or oblong-lanceolate, and conspicuously fringed with narrow spinulose serratures. Teeth of the calyx always entire, and broadly lanceolate at the base. Legumes 2-seeded. The Indians of California collect the seeds for food.

TRIFOLIUM HETERODON, *β. Torr. & Gray, Fl.* 1, *p.* 318. Monterey, California, May; *Parry.* Differs from the preceding in being glabrous, with oblong or obovate leaflets; the stipules much less cut; the calyx-teeth subulate from a narrow base; the two upper ones 2—3-cleft, and in the legumes 4—5-seeded.

TRIFOLIUM SPINULOSUM, *β. Torr. & Gray, l. c.* Near Monterey, California, May; *Parry.* Near the last, but distinguished by the entire teeth of the calyx, more laciniate stipules and 2-seeded legumes. From T. fimbriatum it differs in being glabrous, and in the much longer and narrower calyx-teeth.

TRIFOLIUM MACRÆI, *Hook. & Arn. Bot. Misc.* 3, *p.* 179. T. albo-purpureum, *Torr. & Gray, Fl.* 1, *p.* 319. Santa Barbara, California, April; *Parry.*

TRIFOLIUM TRIDENTATUM, *Lindl. Bot. Reg. sub t.* 1070. T. involucratum, *Torr. & Gray, l. c. non Willd.* Santa Barbara, California; *Parry.*

TRIFOLIUM INVOLUCRATUM, *Willd. Sp.* 3, *p.* 1372; *Gray, Pl. Wright.* 2, *p.* 41. Hills at the Copper Mines and along the Mimbres, New Mexico, June; *Bigelow.* Mabibi, Sonora; *Thurber.*

TRIFOLIUM BEJARIENSE, *Moricand, Pl. Nouv. Amer. p.* 2, *t.* 2. Western Texas, April; *Wright.*

TRIFOLIUM FUCATUM, *Lindl. Bot. Reg. t.* 1883; *Torr. & Gray, l. c.* T. physopetalum, *Fisch. & Mey. Ind. Sem. St. Petersb.* 1837, *p.* 18. Santa Barbara, and on the beach San Juan Capristano, California, March—May; *Parry.* San Isabel; *Thurber.* As tout species, easily distinguished by its very large head, and broadly lanceolate entire segments of the involucre.

TRIFOLIUM AMPLECTENS, *Torr. & Gray, l. c.* 1, *p.* 319*; Hook. & Arn. Bot. Beech. p.* 330, *t.* 78. San Fernando and San Luis Obispo, California; *Parry.*

TRIFOLIUM VARIEGATUM, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 317, Sonora, June; *Thurber.*

TRIFOLIUM MICROCEPHALUM, *Pursh, Fl.* 2, *p.* 478; *Torr. & Gray, l. c.* San Diego, California, May; *Thurber.*

HOSACKIA OBLONGIFOLIA, *Benth. Pl. Hartw. p.* 305. Mountains east of San Diego, California, June; *Parry.* Resembles H. bicolor, but differs in being pubescent, and in the narrowly oblong acute leaflets, as well as in other characters. The legume is straight, about an inch and a quarter long, and scarcely two lines wide. I have never seen H. bicolor with bracts, but in this species there is always a unifoliate bract to each head of flowers.

HOSACKIA GRACILIS, *Benth. in Linn. Trans.* 17, *p.* 365; *Torr. & Gray, Fl.* 1, *p.* 323. (TAB. XV.) Monterey, California, May. A rare species which we have received only from the vicinity of Monterey. It has much the appearance of a depauperate state of H. bicolor. The petiolate trifoliate bract is always present.

HOSACKIA STRIGOSA, *Nutt. in Torr. & Gray, l. c.* H. rubella, *Nutt. l. c.* Near Santa Barbara, California, March; *Parry.* Annual. Stem branching from the base; the branches 3—4 inches long. Flowers nearly one-third of an inch long. H. nudiflora, *Nutt.* seems hardly distinct from this species. In H. rubella we find on the same specimens some peduncles with unifoliolate bracts, and others in which the bracts are reduced to minute gland-like scales.

HOSACKIA PUBERULA, *Benth. Pl. Hartw. p.* 305 ; *Gray, Pl. Wright.* 1, *p.* 50*; Torr. Bot. Parke in Pacific R. Road Expl.* 7, *p.* 10, *t.* 4. Western Texas, New Mexico, Chihuahua, Sonora and California.

H. PUBERULA, var. NANA, etc., *Gray, l. c.* Organ mountains, New Mexico, *Bigelow.* Ojo de Vaca, Chihuahua ; *Thurber.*—H. Wrightii, *Gray* seems to pass into this species. A variety with obovate leaflets was found by Schott, in the valley of the Gila, and by Captain E. K. Smith, in Sonora.

HOSACKIA PURSHIANA, *Benth.; Torr. & Gray, l. c.* Between Tucson and the Rio Gila, Sonora, March—September ; *Parry, Thurber.* Monterey, California ; *Parry.* Varies with the upper, and sometimes all the leaves unifoliolate, when it is the H. unifoliolata, *Hook. Fl. Bor.-Am.* 1, *p.* 135. This synonym was inadvertently overlooked in the Flora of North America, as it was also by Hooker in noticing the same form in *Pl. Geyer.*—(See Lond. Jour. Bot. 7. p. 210.)

HOSACKIA MARITIMA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 326. San Isabel, California, May ; *Thurber.*

HOSACKIA SUBPINNATA, *Torr. & Gray, l. c.; Benth. Pl. Hartw. p.* 306. San Isabel, California, May ; *Thurber.* H. Wrangeliana should probably be united to this species.

HOSACKIA BRACHYCARPA, *Benth. l. c.* Sonora ; *Thurber.* The mature pod is nearly twice as long as the calyx, but is always much shorter than in H. subpinnata.

HOSACKIA ARGOPHYLLA, *Gray, Pl. Thurb. p.* 316. On rocks, San Isabel, California, May; *Thurber.*

HOSACKIA TOMENTOSA, *Hook. & Arn. Bot. Beechey, p.* 137*; Torr. & Gray, l. c.* Monterey, California ; *Parry.*

HOSACKIA CYTISOIDES, *Benth. l. c.; Torr. & Gray, l. c. β.* Syrmatium glabrum, *Vogel?* Monterey, California, May ; *Parry.* Leaflets mostly 3. Flowers reddish.

HOSACKIA SCOPARIA, *Nutt. in Torr. & Gray, l. c.* Ravines near San Diego, and in other parts of California, May ; *Parry, Thurber.*

HOSACKIA JUNCEA, *Benth. l. c.* In the Colorado desert ; *Schott.* Too near the last species.

ASTRAGALUS COBRENSIS, *Gray, Pl. Wright.* 2, *p.* 43, (*adnot.*) Copper Mines, New Mexico, April, and Ben Moore, Cohahuila, June (fruit) ; *Bigelow.*

ASTRAGALUS BIGELOVII, *Gray, l. c. p.* 42. Between the Rio San Pedro and the Rio Grande, western Texas ; also at the base of the Organ mountains and near the Copper Mines, New Mexico ; west to the Santa Cruz valley, Sonora ; March—May.

ASTRAGALUS DIDYMOCARPUS, *Hook. & Arn. Bot. Beechey, p.* 334, *t.* 81*; Torr. & Gray, l. c.* High beach near San Juan Capristano, and at Santa Barbara, California, March ; *Parry.* The leaflets in most of our specimens are narrowly cuneate-oblong, and notched at the summit.

ASTRAGALUS NUTTALLIANUS, *DC.; Torr. & Gray, Fl.* 1, *p.* 334 ; *Gray, l. c. p.* 52. Valleys of the Rio Grande and its tributaries in western Texas, New Mexico, Cohahuila and Chihuahua ; also in Sonora ; March—June. Variable in size, foliage, and other characters.

ASTRAGALUS HUMISTRATUS, *Gray, Pl. Wright.* 2, *p.* 43. Hills at the Copper Mines, June—July ; *Bigelow, Thurber.* Leaflets more obtuse than in Wright's specimens.

ASTRAGALUS GLAREOSUS, *Dougl. in Hook. Fl. Bor.—Am.* 1, *p.* 152? Near the Copper Mines, May—June; *Bigelow.* Guadaloupe Pass, Sonora.

ASTRAGALUS HARTWEGI, *Benth. Pl. Hartw. p.* 10. El Podrero, near the 110° of longitude, Sonora; *Schott.*

ASTRAGALUS CYANEUS, *Gray, Pl. Fendl. p.* 34. Doña Ana, New Mexico, April; *Thurber.*

ASTRAGALUS VACARUM, *Gray, Pl. Wright.* 2, *p.* 43. Ojo de Vaca, Chihuahua; *Thurber.*

ASTRAGALUS (PHACA) TEPHRODES, *Gray, Pl. Wright.* 2, *p.* 45. Gravelly plains near the base of the Organ mountains and on the Mimbres, New Mexico, April—May; *Bigelow, Thurber.*

ASTRAGALUS (PHACA) FENDLERI, *Gray, l. c. p.* 44. Hills at the Copper Mines, October, (in fruit); *Bigelow.*

ASTRAGALUS (PHACA) SONORÆ, *Gray l. c.* Tubac, Sonora, March; *Parry.*

ASTRAGALUS (PHACA) THURBERI, *Gray, Pl. Thurb. p.* 312. Fronteras, Sonora, June; *Thurber.*

ASTRAGALUS (PHACA) LEUCOPSIS, *Torr. & Gray, Fl.* 1, *p.* 694. Phaca canescens, *Nutt. in Torr. & Gray, l. c. p.* 344, *non Hook. & Arn.* (TAB. XVI.) San Diego, California; *Parry, Schott.* The pods are about an inch and a quarter long, excluding the stipe, which is 4 lines long.

ASTRAGALUS (PHACA) CROTALARIÆ, *Benth. Pl. Hartw. p.* 307. (TAB. XVII.) Mountains east of San Diego, California, June, (with flowers and ripe pods;) *Parry.* A stout species, commonly 4—6 feet high.

ASTRAGALUS (PHACA) TRIFLORUS, *Gray, Pl. Wright.* 2, *p.* 45. Phaca triflora, *DC.* Sandy plains and mountains on the upper Rio Grande, in New Mexico and western Texas; also in Cohahuila; April.

OXYTROPIS LAMBERTI, *Pursh, var. Gray, Pl. Wright.* 1, *p.* 53. Hills near the Copper Mines, and Ojo Caliente; *Bigelow.*

CHÆTOCALYX WISLIZENI, *Gray, Pl. Wright.* 1, *p.* 51, *&* 2, *p.* 45. (TAB. XVIII, fig. 5—7.) Mount Carmel, and mountains of Santa Rosa, Cohahuila, October—November, (in fruit;) *Parry, Bigelow.*

CHÆTOCALYX SCHOTTII (n. sp.:) prostratus fere glaber; foliolis 5 ovatis acutis valde mucronatis concoloribus; dentibus calycis lineari-subulatis nudis tubo sub duplo-longioribus; carina alæ subæquantibus; staminibus superne æqualiter diadelphis. (TAB. XVIII.) Sierra Verde, Aroyo de los Samotas, Sonora, August; *Schott.* Stem branching from a somewhat woody base, slender, 2—3 feet long, twining towards the extremity. Leaflets 6—8 lines long, thin, those of the lowest leaves obtuse, the others acute and pointed with a conspicuous mucro. Flowers about six in axillary fascicles or short racemes. Pedicels rather shorter than the flowers. Calyx broadly campanulate, entirely destitute of glands. Corolla yellow. Vexillum ovate-oblong, emarginate, slightly pubescent. Wings and keel-petals oblong, acute. Stamens monadelphous below, diadelphous above, five on each side of the pistil. Ovary, mostly three-ovuled. Mature pod not known, but the young ones are 2—3-jointed; the terminal joint foliaceous and dilated. Differs from C. Wislizeni in the narrow acute leaves, and the long teeth of the calyx.

ZORNIA TETRAPHYLLA, *Michx. Fl.* 2, *p.* 76; *Torr. & Gray, Fl.* 1, *p.* 354. Laredo and Ringgold Barracks, June; *Schott.*

DESMODIUM GRAHAMI, *Gray, Pl. Wright.* 2, *p.* 48. Rocky places, on mountains of the Limpio river, and hills at the Copper Mines, July—August; *Bigelow.*

DESMODIUM ANNUUM, *Gray, l. c.* Santa Cruz, Sonora, September; *Thurber.*

DESMODIUM EXIGUUM, *Gray, l. c.* With the last; *Thurber.*

DESMODIUM PANICULATUM, *DC.; Torr. & Gray, Fl.* 1, *p.* 363. Devil's River valley, western Texas, (flowers and fruit), September; *Bigelow.*

DESMODIUM CINERASCENS, *Gray, l. c. p.* 48. Sonora, in various places, June; *Thurber.*

DESMODIUM WRIGHTII, *Gray, Pl. Lindh.* 2, *p.* 177. Dry mountain ravines, on the Limpio; July, (fruit;) *Bigelow.*

DESMODIUM NEO-MEXICANUM, *Gray, Pl. Wright.* 1, *p.* 53. Copper Mines, New Mexico, and Santa Cruz, Sonora, September; *Thurber.* A variety with broader and more strongly reticulated leaves than usual was found by Schott on the mountains of San Estaban, in Sonora.

LESPEDEZA VIOLACEA, *Pers.* var. SESSILIFLORA, *Torr. & Gray, Fl.* 1, *p.* 367. Central Texas; *Schott.*

CROTALARIA LUPULINA, *DC. Prodr.* 2, *p.* 133. Brazos Santiago, and Sonora, May; *Schott.* Chihuahua and Sonora; *Thurber.* Remarkable for its long spur-like projecting keel.

CROTALARIA SAGITTALIS, *Linn.; Torr. & Gray, Fl.* 1, *p.* 370. Sonora; *Thurber.*

LUPINUS DENSIFLORUS, *Benth. in Hort. Trans.* (*n. ser.*) 1, *p.* 409; *Torr. Pacif. Railroad Expl.* 4, *p.* 81. L. Menziesii; *Agardh, Syn. Lup. p.* 2. Monterey, California, May; *Parry.* San Diego; *Thurber.*

LUPINUS HIRSUTISSIMUS, *Benth. l. c.* San Pasqual, California, May; *Thurber.*

LUPINUS SUBCARNOSUS, *Hook. Bot. Mag. t.* 3467; *Gray, Pl. Wright.* 1, *p.* 54. L. Texensis; *Hook.* Western Texas, May—June; *Thurber.*

LUPINUS TRUNCATUS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 373. San Diego, California, March—May; *Parry, Thurber.*

LUPINUS SPARSIFLORUS, *Benth. Pl. Hartw. p.* 303. Near San Diego, California, May; *Thurber.*

LUPINUS BICOLOR, *Lindl. Bot. Reg. t.* 1109; *Torr. & Gray, l. c.* San Pasqual, California, May; *Thurber.*

LUPINUS MICRANTHUS, *Dougl. in Bot. Reg. t.* 1251. Napa Mountains, California, March; *Thurber.*

LUPINUS PUSILLUS, *Pursh, Fl.* 2, *p.* 468. Gravelly plains near the Organ Mountains, and hills at the Copper Mines, New Mexico; also near Frontera, March—April. Tucson, Sonora, and valley of the Santa Cruz, Sonora; *Parry, Capt. E. K. Smith.*

LUPINUS RIVULARIS, *Lindl. Bot. Reg. t.* 1595; *Torr. & Gray, Fl.* 1, *p.* 376. San Diego, California; *Parry.*

LUPINUS CYTISOIDES, *Agardh, Lup. p.* 18. San Isabel, California, May; *Thurber.*

LUPINUS AFFINIS, *Agardh, l. c. p.* 20. Monterey, California; *Parry.*

LUPINUS MEXICANUS, *Lagasca; Gray, Pl. Wright.* 2. *p.* 49. On the mountain called Ben Moore, near the Copper Mines, and at Crucis, New Mexico, April—May; *Bigelow.*

LUPINUS ORNATUS, *Dougl. in Bot. Reg. t.* 1216. Napa county, California, March; *Thurber.*

LUPINUS DOUGLASII, *Agardh, Lup. p.* 34. South of San Louis Obispo, and near Monterey, California; *Parry.*

LUPINUS ALBIFRONS, *Benth.; Agardh, l. c. p.* 33. Monterey; *Parry;* and near San Pasqual, California. May; *Thurber.*

LUPINUS ARBOREUS, *Sims in Bot. Mag. t.* 682; *Agardh, l. c. p.* 25; *Benth. Pl. Hartw. p.* 303. Near San Diego and Monterey, California, May; *Parry.* A bushy shrub, with a stem which is sometimes 1½ inch in diameter. It is a rare species in California, but is not uncommon in the gardens of Europe, into which it is generally thought to have been introduced from South America; but we strongly suspect that the seeds were brought by Menzies to England from California.

LUPINUS LITTORALIS, *Dougl.; Agardh, l. c. p.* 36. Monterey, California, May; *Parry.*

SOPHORA SERICEA, *Nutt. Gen.* 1, *p.* 280; *Gray, Pl. Wright.* 1, *p.* 54. Low moist places along the Rio Grande and its tributaries, from New Mexico to San Elceario; also in Coahuila; May—June.

SOPHORA SPECIOSA, *Benth.; Gray, Pl. Wright.* 1, *p.* 54. Rocky valley of the Pecos; September, (in fruit;) *Bigelow.* Fort Inge, Texas; *Parry.* Rinconada Pass, Neuvo Leon; *Thurber.*

SOPHORA TOMENTOSA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 389. Brazos, Santiago, Texas; May; *Schott.*

THERMOPSIS FABACEA, *DC. Prodr.* 2, *p.* 99. T. montana, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 388. Napa county, California, March; *Thurber.* Near the summit of the mountains east of San Diego, California, June; *Parry.*

OLNEYA TESOTA, *Gray, Pl. Thurb. p.* 328; *Torr. in Pacif. Railroad Expl.* 7, *p.* 10, *t.* 5. Ravines in the table lands on the lower Gila, often in company with Cercidium floridum; *Parry, Thurber.* Hills near Fort Yuma, California, January; *Schott.*

CERCIS OCCIDENTALIS, *Torr. in Gray, Pl. Lindheim.* 2, *p.* 177. Valley of the Devil's river, western Texas; *Bigelow.* Also in California. Mr. Blake informs me that the camels, lately imported into the United States, are very fond of the leaves of this plant.

HOFFMANSEGGIA JAMESII, *Torr. & Gray, Fl.* 1, *p.* 54; *Gray, Pl. Wright.* 2, *p.* 49. Sandy places near Fort Fillmore, and other places, in New Mexico, April—September; *Bigelow.*

HOFFMANSEGGIA CAUDATA, *Gray, Pl. Lindh.* 2, *p.* 179; *Pl. Wright.* 1, *p.* 54. On the lower Rio Grande, April; *Schott.* In our specimens there are from 2—4 pinnæ. The leaflets vary from 4 to 7 pairs in the lateral pinnæ, and from 9—15 (rarely only 7) in the terminal one. Sometimes they are scarcely a line in length.

HOFFMANSEGGIA MICROPHYLLA (n. sp.:) puberula; ramis elongatis virgatis; pinnis unijugis cum impari, lateralibus 10—12-foliolatis, terminali 14—20-foliolata, foliolis minutis oblongis eglandulosis; bracteis stipulisque caducis; racemo laxifloro elongato; legumine subfalcato acuto glandulis subsessilibus asperato. Sandy desert of the Colorado, California; *Schott.* Plant apparently two feet or more in height. Stem and branches green, minutely velvetty, pubescent. Lateral pinnæ 3—4 lines long, the terminal one nearly twice as long. Leaflets scarcely a line in length, pubescent. Calyx softly pubescent. Corolla yellow; the claws of all, and the back of the vexillum, somewhat glandular. Ovary thickly covered with pale disciform glands. Pods sessile, about ¾ of an inch long and nearly 3 lines wide, nearly straight on the upper suture, 4—6-seeded.

HOFFMANSEGGIA OXYCARPA, *Gray, Pl. Wright.* 1, *p.* 55. Vallies and hills of the San Pedro river, Texas, May; *Bigelow.*

HOFFMANSEGGIA STRICTA, *Benth. in Gray, Pl. Wright.* 1, *p.* 56. Sterile soils along the Rio Grande, from El Paso to Eagle Pass, Texas; also in New Mexico, April—July.

H. STRICTA β. DEMISSA, *Gray, l. c.* San Elceario; *Parry.* On the Pecos; *Schott.*

HOFFMANSEGGIA MELANOSTICTA, *Gray, l. c. p.* 54, (*adnot.*) Pomaria melanosticta, *Schauer.* On the Rio Grande below the cañon of San Carlos, October, (in flower and fruit;) *Parry.* Rinconada, and Monterey, Neuvo Leon; *Dr. Edwards.* Our plant differs somewhat from the description of Schauer in Linnæa. There are only 2 or 3 pairs of leaflets, and the pod is 3—4-seeded. The vexillum, also, is destitute of glands and dots.

CASPARIA, *n. sp.?* Rocky hills near Santa Rosa, Chihuahua; *Parry*. An erect shrub, 2–3 feet high. Branches slender, flexuous, smooth. Leaflets distinct to the base, semiovate, very obtuse. 3-nerved, very smooth. Pods (old and imperfect) about 2 inches long and one-third of an inch wide

CERCIDIUM TEXANUM, *Gray, Pl. Wright.* 1, *p.* 58. Common on the Rio Grande from El Paso to Eagle Pass, forming dense thickets in many places.

CERCIDIUM FLORIDUM, *Benth. in Gray, l. c. (adnot.)*; *Torr. in Pacif. R. Road Expl.* 6, *p.* 360, *t.* 3. On the Lower Gila and Colorado rivers; *Emory, Schott.* This is the Palo Verde of the Mexicans, and the Green-bark Acacia of American travellers.

CASSIA PUMILIO, *Gray, Pl. Lindh.* 2, *p.* 180, & *Pl. Wright.* 1, *p.* 59. Elm Creek valley, near Eagle Pass, and at the mouth of the Pecos; *Schott, Bigelow.*

CASSIA RŒMERIANA, *Scheele in Linnæa*, 21, *p.* 457; *Gray, Pl. Lindh. l. c.* Arroyo Zoquete and gravelly hills near Rock creek; July—September.

CASSIA BAUHINIOIDES, *Gray, Pl. Lindh. l. c.*, & *Pl. Wright.* 1, *p.* 59. Sandy plains and rocky situations, Leon springs and along the Rio Grande from El Paso down to Eagle Pass; also in Chihuahua, Durango, and Sonora, April—August. Leaflets but a single pair in all our specimens. Near Presidio San Vincente Dr. Parry found a variety with the leaflets broadly ovate. The same form is in Mr. Wright's collection.

CASSIA LINDHEIMERIANA, *Scheele, l. c.*; *Gray, l. c.* Dry ravines near the Flounce mountains. Between the San Pedro and the Pecos; also along the Rio Grande, June, August. Arroyo del Pozo Verde; *Schott.*

CASSIA WISLIZENI, *Gray, Pl. Wright.* 1, *p.* 60, & 2, *p.* 50. Hills and rocky places. Cañon of Bossecillos, on the Rio Grande; August. *Parry, Bigelow.* San Bernardino, Sonora; June. *Thurber.* Leaflets sometimes 4 pairs, larger than in Wright's specimens. A neat and showy plant, well deserving of cultivation.

CASSIA WRIGHTII, *Gray, Pl. Wright.* 2, *p.* 50. On the Rio Mimbres, New Mexico; June, (flowers and fruit;) *Bigelow.* Sierra de los Tanos, Sonora; *Schott.*

CASSIA NICTITANS, *Linn.*; *Torr & Gray, Fl.* 1, *p.* 396. Comanche springs and Leon springs; *Bigelow.* Differs from the eastern plant in its narrower and more numerous seeded pods, and in the stipitate glands of the petioles; but it does not appear to be a distinct species.

CASSIA CHAMÆCRISTA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 395. Sandy places between Ringgold barracks and Laredo; June. *Schott.*

CASSIA CHAMÆCRISTOIDES, "*Collad. Mon. Cass. p.* 134." C. cinerea, *Cham. & Schlecht.* With the last; *Schott.*

CASSIA OBTUSIFOLIA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 394. Island of the Lost Rock, in the Lower Rio Grande; *Schott.*

PARKINSONIA ACULEATA, *Linn.; DC. Prodr.* 2, *p.* 486. Alluvions and prairies of the Lower Rio Grande, and hills of the Colorado, near Fort Yuma, California; *Schott.* Fort Duncan, Texas; *Dr. Edwards.* Between Reynosa and Matamoras, Mexico; *Dr. Gregg.* An ornamental prickly shrub, now cultivated or naturalized in most of the warmer parts of the world, but probably, as Alph. De Candolle thinks, of American origin. According to Mr. Schott it is valued by the Mexican Indians as a febrifuge and sudorific, and also as a remedy in epilepsy.

PARKINSONIA MICROPHYLLA, *Torr. in Pacif. R. Road Expl.* 4, *p.* 82: glabriuscula ramosissima;

ramulis (saepe?) in spinas abuentibus; foleis geminis vel teenis pinnatis, petiolo cammuni exalato supra canaliculato, foliolis 4—7-jugis minimis (1 lin. long.) suborbiculatis late ovalibusve obtusis subcoriaceis; staminibus petalis longioribus. On the Colorado, near Fort Yuma; *Schott.* This is an interesting addition to our Flora, being an undoubted native Parkinsonia, entirely distinct from P. aculeata, and much more nearly related to P. Africana, *Soud.* (*in Linnæa*, 23, *p.* 38.) We have seen no specimens showing the inflorescence but only a few loose flowers from the collections of Mr. Schott. From the fructiferous specimens it would appear that the racemes are fewer-flowered and the pedicels shorter than in P. aculeata. The flowers, too, are smaller, the stamens much more exserted, and the petals (except the vexillum) are ovate, not roundish, as in that species. The pods are nearly the same in both. These vary from 2 to several-seeded, and are constricted between the seeds with a very long acumination.

CÆSALPINIA PULCHERRIMA, *Swartz; Torr. & Gray, Fl.* 1, *p.* 397. Ures, Sonora, October; *Thurber.*

ALGAROBIA GLANDULOSA, *Torr. & Gray, l. c. p.* 399; *Gray, Pl. Wright.* 1, *p.* 60. Sandy soils along the Rio Grande and its tributaries and in the Mexican States. Common on the bottom lands of the Gila. This is the celebrated mesquite, so often noticed in the reports of western exploration. Dr. Gray (l. c.) suspects that it may be united (together with P. dulcis and P. Siliquastrum) to P. juliflora. It affords a gum nearly equal to gum arabic, of which it stated that large quantities have lately been sent to San Francisco from Mexico.

STROMBOCARPA PUBESCENS, *Gray, Pl. Wright. p.* 60; *Torr. Pacif. R. Road Expl.* 6, *p.* 360, *t.* 4. Valley of the Rio Grande from New Mexico, 20 miles below San Elceario; *Bigelow.* Bottom lands of the Rio Gila and R. Colorado. The *Screw-bean* or *Screw-mesquite* of American travellers and Tornillo of the Sonorians.

STROMBOCARPA CINERASCENS, *Gray, l. c. p.* 61, *adnot.* Boggy places, Fort McIntosh, and other places on the Lower Rio Grande, May, November; *Schott.* The thorns are variable in length, being sometimes longer, sometimes much shorter than the leaves. Pods like those of S. pubescens, except that they are a little thicker.

NEPTUNIA LUTEA, *Benth. in Hook. Torr. Bot.* 4, *t.* 356. Painted Caves, and near Eagle Pass, western Texas, June; *Bigelow, Schott.* In our specimens the fruit is sessile, while it is stipitate in the Florida plant.

DESMANTHUS VELUTINUS, *Scheele in Linnæa*, 21, *p.* 456; *Gray, Pl. Lindh.* 2, *p.* 183. Hills at the Copper Mines, August; *Bigelow.* Common near Eagle Pass; *Schott.*

DESMANTHUS JAMESII, *Torr. & Gray, Fl.* 1, *p.* 402; *Gray, Pl. Wright.* 2, *p.* 63. Gravelly hills along Rock Creek; and rocky places at the Copper Mines. July, (in flower,) August, (in fruit); *Bigelow, Parry.*

MIMOSA FRAGRANS, *Gray, Pl. Lindh.* 2, *p.* 182; *& Pl. Wright.* 1, *p.* 61. Head of the Rio San Pedro; *Bigelow.* Eagle Pass, April—June; *Schott.*

MIMOSA BOREALIS, *Gray, Pl. Fendl. p.* 39, *& Pl. Wright. l. c.* Plains near Live Oak Creek, September, (in fruit); *Bigelow.*

MIMOSA LINDHEIMERI, *Gray, Pl. Lindh.* 2, *p.* 181. Rocky and gravelly hills and ravines, July; *Bigelow.*

MIMOSA DYSOCARPA, *Benth. in Gray, Pl. Wright*, 1, *p* 62. On the Cibolo of the Rio Grande and Rock Creek; also hills at the Copper Mines, July—August; *Bigelow.*

MIMOSA MALACOPHYLLA, *Gray, Pl. Lindh.* 2, *p.* 182, *adnot., & Pl. Wright.* 1, *p.* 163. Rocky hills near Santa Rosa, Chihuahua; *Bigelow*. Sometimes there are one or two short prickles or teeth on the margin of the pods.

M. MALACOPHYLLA var. GLABRA, *Gray*. La Blanca on the Lower Rio Grande; *Schott*. The same as No. 815 and 2235, *Berlandier*.

MIMOSA FLEXUOSA, *Benth. in Gray, Pl. Wright.* 1, *p.* 62. Hills near Rock Creek, July; *Bigelow*.

MIMOSA BIUNCIFERA, *Benth. Pl. Hartw. p.* 12; *Gray, Pl. Wright.* 2, *p.* 61. With the last, and at Eagle Springs. Mababi, Sonora, June; *Thurber;* Sierra del Pajarito; *Schott*.

MIMOSA STRIGILLOSA, *Torr. & Gray, Fl.* 1, *p.* 399. On the Lower Rio Grande, May; *Schott*.

MIMOSA BERLANDIERI (Gray, MSS. Habbasiæ Rubicaulium): "fruticosa erecta; ramis et interdum petiolis aculeis sparsis brevibus rectis armatis, junioribus puberulis setis brevioribus parce strigosis; stipulis ovato-subulatis; pinnis 4—6-jugis, costis subtus strigosis; foliolis 20—40-jugis linearibus acutiusculis glabellis obsolete 3—4-nervatis; capitulis pedunculatis racemoso-subpaniculatis; floribus tetrameris; calyce minimo truncato; legumine breviter stipitato oblongo-lineari nudo hirtello 8—10-articulato." Banks of the Lower Rio Grande, towards its mouth, November; *Schott*. Environs of Matamoras; *Berlandier*, (No. 3146.)

SCHRANKIA UNCINATA, *Willd. Sp.* 4, *p.* 1043? Stone-wreath Hills, on the Lower Rio Grande, April; *Schott*. The pods not being sufficiently mature, we cannot be certain of the species.

CALLIANDRA HUMILIS, *Benth. in Lond. Jour. Bot.* 5, *p.* 103; *Gray, Pl. Wright.* 2, *p.* 53. Near the Copper Mines, New Mexico, June—August; *Bigelow*.

CALLIANDRA RETICULATA, *Gray, l. c.* With the last; August.

CALLIANDRA HERBACEA, *Engelm. in Pl. Fendl. p.* 39; *Gray, Pl. Wright.* 1, *p.* 63. Low places on the Limpio, and near Rock Creek, July; *Bigelow*.

CALLIANDRA CHAMÆDRYS, *Engelm. l. c.; Gray, l. c.* On the more elevated parts of the Sierras of Sonora, March—July; *Thurber, Schott*.

CALLIANDRA (PORTORICENSIS, *Benth.* var.): glabriuscula, inermis; ramulis gracilibus; pinnis bijugis, foliolis 4—5-jugis oblongis obtusissimis sub remotis membranaceis basi inferiore subauriculatis ciliolatis, petiolis elongatis; stipulis lanceolatis striatis rigidis; pedunculis petiolo longioribus; calyce profunde 5-fido globoso corolla glabra dimidio breviore. Arroyo de los Samotas, Sierra Verde, Sonora, August; *Schott*. Peduncles 1½—2½ inches long. Flowers pale rose color. Filaments half an inch long. Pods not seen.

LUCÆNA RETUSA, *Gray, l. c. p.* 64. Hills and gravelly places between the San Pedro and the Rio Grande, July—September; *Bigelow, Schott*.

ACACIA WRIGHTII, *Benth. in Gray, l. c.* On the Rio Grande, Texas; and Sierra del Pajarito, Sonora, July—August; *Schott*.

ACACIA GREGGII, *Gray, l. c. p.* 65. Dry hills, El Paso and down the Rio Grande to the Great Cañon; also hills and mountains along the Gila to California, May—July.

ACACIA RIGIDULA, *Benth. in Lond. Jour. Bot.* 1, *p.* 504. Rocky hills, Leona. Also found by Dr. Edwards and Major Eaton near Monterey, Neuvo Leon. The slender spines are sometimes more than an inch long.

ACACIA RŒMERIANA, *Scheele in Linnæa*, 21, *p.* 456. Fort Inge, Texas; *Parry*. Mountains and rocky places, Presidio del Norte, August; *Bigelow*.

ACACIA TEPHROLOBA, *Gray, l. c. p.* 65. Hills on the San Pedro or Devil's river, September; (in fruit;) *Bigelow*.

Acacia Coulteri, *Benth. l. c.; Gray, Pl. Wright.* 2, *p.* 53. Eagle Pass and plains, and plains near Zoquete Creek; *Bigelow.*

Acacia flexicaulis, *Benth.; Gray, l. c.* 1, *p.* 65, *adnot.* Monterey, Neuvo Leon, &c.; *Thurber.* This is clearly the same as Gregg's plant.

Acacia cuspidata, *Schlecht. in Linnæa,* 12, *p.* 513; *Gray, Pl. Wright.* 1, *p.* 66. A. hirta, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 404. A. Texensis, *Torr. & Gray, l. c.* Plains and dry places along the Rio Grande, and in New Mexico; also in Sonora; June—October. After a careful comparison of numerous specimens of the first and last species here quoted with an original specimen of A. Texensis, I unite the whole without hesitation.

Acacia constricta, *Benth. in Gray, Pl. Wright.* 1, *p.* 64. Hills along the Rio Grande, from El Paso to the Presidio del Norte; also near Tascata, and in Sonora; May—July. Sometimes the leaves have only 1 or 2 pairs of pinnæ; but such occur chiefly on very short branches or spurs. The leaves and young branches are strongly pubescent in specimens collected near the Presidio del Norte by Dr. Parry.

Acacia Schottii (n. sp.:) glabra; spinis stipularibus subulatis rectis; foliis fasciculatis unijugis; foliolis 3—5-jugis filiformi-linearibus alternis; legumine lineari complanato toruloso curvato, valvulis coriaceis. Near the Cañon of San Carlos, at the Comanche Crossing of the Rio Grande, September, (in fruit); *Parry.* Branches flexuous terete. Petiole below the fork one-third of an inch long. Pinnæ an inch in length. Leaflets 2 lines long, and scarcely $\frac{1}{3}$ of a line wide, thick. Spines 2—3 lines long. Peduncles slightly bracteate in the middle. Stamens very numerous. Legume 2—3 inches long, and $\frac{1}{4}$ of an inch wide, elevated on a short stipe, 6—9-seeded, curved into a semi-circle, or even a nearly complete circle. This is a very distinct species, but seems to be allied to A. constricta.

Acacia Farnesiana, *Willd.* A. Cavenia. *Hook. & Arn. Bot. Beechey, p.* 21; *Benth. Mimos. in Hook. Lond. Jour. Bot. l. c.* Common on the boundary from Texas to California.

"Acacia tortuosa, *Willd. Sp.* 4, *p.* 1083, *Benth. Mimos. in Hook. Lond. Jour. Bot.* 1, *p.* 392. A. albida. *Lindl. Bot. Reg. t.* 1317. Vachellia Lindheimeri seu minor. *Engelm. MS. in herb. Gray.* Plains near Eagle Pass on the Rio Grande, and on hill sides, Santa Rosa, Chihuahua; *Bigelow.* Tamaulipas; *Berlandier.* In flower this species is readily mistaken for A. Farnesiana; but Dr. Engelmann had distinguished it even in that state. Flowering specimens have been confounded with A. Cavenia, which is only A. Farnesiana. The present species is well distinguished by its pod, which is elongated-linear, 3 to 5 inches long, narrow, nearly terete, moniliform, fleshy, and minutely tomentose; seeds uniserial, compressed, black. The corolla is longer than in A. Farnesiana. The heads and peduncles are nearly glabrous in our specimens."—*A. Gray.*

Acacia? crassifolium, *Gray, Pl. Thurb. p.* 317. La Peña, Cohahuila; *Dr. Edwards, Thurber.*

Pithecolobium brevifolium, *Benth. in Gray, Pl. Wright.* 1, *p.* 67. Rocky hills around the silver mines of Santa Rosa, Coahuila. January, (with fruit of the preceding season;) *Bigelow.*

ROSACEÆ.

Prunus (Cerasus) Virginiana, *Linn. Sp.* 1, *p.* 473. Dry ravines near Camp Baehe, New Mexico, and at the Copper Mines; July; in fruit.

Prunin Capollin, *DC. Prodr.* 2, *p.* 539, (sub Ceraso;) *Gray, Pl. Wright.* 2, *p.* 544. Sides of the Limpio mountain, Texas; *Bigelow.* Sierra del Pajaritos, &c., Sonora; *Schott, Capt. E. K. Smith.*

Prunus demissa, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 411, (sub Ceraso.) On the mountains east of San Diego, California, June, in flower; *Parry.* A shrub seldom more than from 4 to 8 feet high.

Prunus ilicifolia, *Nutt. l. c.* (sub Ceraso,) *& N. Amer. Sylv.* 2, *p.* 16, *t.* 47; *Hook. & Arn. Bot. Beechey, p.* 340, *t.* 83. Near San Diego, and in other parts of California, May; *Parry, Thurber.* This ornamental species seldom attains a greater height than 8 or 10 feet. The pulp of the fruit is flesh color and rather thin, but palatable.

Prunus subcordata, *Benth. Pl. Hartw. p.* 308. Eastern slope of the Cordilleras of California, and near San Felipe. A straggling bush 4 to 5 feet high. Fruit sub-globose, half an inch in diameter, the pulp thin and disposed to separate into two valves.

Prunus minutiflora, *Engelm. in Pl. Lindh.* 2. *p.* 185 (sub Pruno); *Gray, Pl. Wright.* 1, *p.* 68. Gravelly places and ravines between Devil's River and the Rio Grande; also in Chihuahua; *Parry, Bigelow.*

Nuttallia cerasiformis, *Torr. & Gray, in Bot. Beechey, p.* 336, *t.* 82, *& Fl.* 1, *p.* 412 Napa county, California, March—April; *Thurber.* San Luis Obispo, in the same State; the most southern station of this plant that has come to our knowledge.

Spiræa ariæfolia, *Smith, in Rees Cyclop.; Torr. & Gray, Fl.* 1, *p*, 416. Monterey, California, May; *Parry.*

Spiræa dumosa, *Nutt. in Hook. Lond. Jour. Bot.* 6, *p.* 217; *Torr. in Stansb. Rep. p.* 387, *t.* 4 Mountains near the Copper Mines, New Mexico, May, in flower, and August, in fruit; *Bigelow.*

Spiræa cæspitosa, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 418. Sides of steep and almost inaccessible rocks on the Rio Grande, about 25 miles below El Paso, in Chihuahua, June; *Bigelow.*

Cercocarpus parvifolius, *Nutt. l. c. p.* 427; *Hook. Ic. t.* 323. C. betulifolius, *Nutt. l. c.* Valley of the Upper Rio Grande, and westward to California. Flowers in May and June, fruit matures in September. The limb of the calyx early breaks away from the tube, and is carried up, with the petals and stamens, on the elongated style, and sometimes remains there until the fruit is considerably grown.

Cowania Mexicana, *D. Don in Linn. Trans.* 14, *p.* 574, *t.* 22. C. Stansburyana, *Torr. in Stansb. Rep. p.* 386, *t.* 3. In various parts of Sonora and western New Mexico, April—June. My extensive series of specimens show that the two species here brought together are connected by intermediate forms.

Cowania ariæfolia, *Torr. in Gray, Pl. Wright.* 2, *p.* 107. Crevices of calcareous rock on the Rio Grande above the mouth of Pecos, October, in flower and fruit; *Parry.*

Acæna pinnatifida, *Ruiz & Pav. Fl. Per.* 1, *p.* 68, *t.* 104: *Torr. & Gray, Fl. p.* 430. (Tab. XIX.) Monterey, California, April; *Parry.*

Adenostoma fasciculata, *Hook. & Arn. Bot. Beechey, p.* 139 *&* 338; *t.* 30. Dry sandy hills and along the base of mountains, San Diego and Monterey, May; *Parry, Thurber.* A thick-set straggling bush, 7—8 feet high.

Adenostoma sparsifolia, *Torr. in Emory's Report, p.* 140. (Tab. XX.) Western slope of the Cordilleras of California, July; *Parry.* This species was first discovered by Major Emory on the same mountains, near Warner's Pass. Dr. Parry states, in his notes, that it is a shrub from 4 to 8 feet high; but Major Emory found some of it 30 feet high. The bark is reddish, and peels off in shreds. The leaves are solitary and alternate, narrowly linear (nearly half an inch long and half a line wide) sparsely dotted (as are the branchlets) with minute roundish glands. Flowers in rather loose terminal panicles. Pedicels very short. Calyx turbinate-campanulate, with several lanceolate bracts at the base; 10-striate, 10-toothed; the teeth very obtuse. Stamens mostly 10, the filaments inserted on the outer crenulate margin of the disk, at the summit of the calyx-tube. Ovary and style as in A. fasciculata. Fruit not known. This seems to be a very distinct species. We have never received the plant except from the station just noticed.

FALLUGIA PARADOXA, *Torr. in Emory, Rep. p.* 139, *t.* 2; *Gray Pl. Fendl. p.* 41, *& Pl. Wright.* 1, *p.* 68. Sieversia paradoxa, *D. Don.* Ravines and rocky places along the Upper Rio Grande, and near the Copper Mines, New Mexico, April—June; the fruit ripe in August.

HORKELIA CUNEATA, *Lindl. Bot. Reg. sub fol.* 1997; *Torr. & Gray, Fl.* 1, *p.* 432. Near Monterey, California, April; *Parry.*

POTENTILLA PARADOXA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 437; *Lehm. Revis. Potent. in Nov. Act. Leopold-Cæs.* 23, (*suppl.*) *p.* 194, *t.* 62. Wet places on the Rio Grande, between El Paso and San Elceario, June, (flowers and fruit;) *Bigelow.*

POTENTILLA GLANDULOSA, *Lindl. Bot. Reg. t.* 1583; *Lehm. l. c. p.* 48. Monterey, California, May; *Parry.* Flowers ochroleucous.

POTENTILLA THURBERI, *Gray, Pl. Thurb. p.* 318; *Lehm. l. c. p.* 92. Around the Copper Mines of New Mexico, July; *Thurber, Bigelow.*

POTENTILLA ANSERINA, *Linn: Lehm. l. c. p.* 88. San Francisco and Monterey, California, April; *Thurber, Parry.*

FRAGARIA VESCA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 448. Pine woods near Monterey, April; *Parry.*

FRAGARIA CHILENSIS, *Ehrh.: Torr. & Gray, l. c.* Sand-hills near San Francisco, California, April; *Parry.*

RUBUS NEO-MEXICANUS, *Gray, Pl. Wright.* 2, *p.* 55. Sides of Ben Moore, near the Copper Mines, June, in flower and fruit; *Bigelow.* The peduncles are sometimes 3-flowered. Allied to R. trilobus, *Moc. & Ses.*

RUBUS TRIVIALIS, *Mich. & Fl.* 1, *p.* 296? Moist shady places, San Luis Obispo and San Diego, California; *Parry.* Mabibi, Sonora, June; *Thurber.*

RUBUS URSINUS, *Cham. & Schlecht, in Linnæa,* 2, *p.* 11; *Torr. & Gray, Fl.* 1, *p.* 456. New Almaden, California, March—April; *Thurber.*

RUBUS NUTKANUS, *Mocino; Torr. & Gray, l. c. p.* 450. Monterey, California, May; *Parry.*

ROSA GYMNOCARPA, *Nutt. in Torr. & Gray, l. c. p.* 461. (TAB. XXI.) San Diego, California, May; *Parry.* A variety with larger leaves occurs at the same place.

ROSA BLANDA, *Ait. Kew.* (*ed.* 1) 2, *p.* 202. Moist places between the Limpia and the Rio Grande, and westward to California; April—May.

AMELANCHIER CANADENSIS var. ALNIFOLIA, *Torr. & Gray, Fl.* 1, *p.* 473. Near the Copper Mines, New Mexico; *Thurber.*

PHOTINIA ARBUTIFOLIA, *Lindl. in Linn. Trans.* 13, *p.* 103, *& Bot. Reg. t.* 491; *Torr. & Gray, l. c.* Monterey, and Cordilleras of California.

VAUQUELINIA CORYMBOSA, *Corr. in Humb. & Bonpl. Pl. Æquin.* 1, *p.* 140, *t.* 40. Spiræa Californica, *Torr. in Emory, Rep. p.* 140. Sierra Verde, Sonora, July, in flower, *Schott.* High mountains near the Gila, November, in fruit; *Maj. Emory.* Dr. Parry's specimens accord with the description and figure of Humb. & Bonpl., except that the leaves are smaller and less deeply toothed. In the plant collected by Maj. Emory, the leaves are ovate-lanceolate and serrate.

LYTHRACEÆ.

NESÆA LONGIPES, *Gray, Pl. Wright.* 1, *p.* 68. Wet places along the Rio Grande, July to October.

NESÆA SALICIFOLIA, *H. B. K. Nov. Gen. & Sp.* 6, *p.* 192. Shore of the Rio Grande, from Ringgold Barracks down to the mouth of the river, September, (in flower and fruit); *Schott.*

LYTHRUM ALATUM, *Pursh, Fl.* 1, *p.* 334; *Torr. & Gray, Fl.* 1, *p.* 482. Common along the Rio Grande and westward to Sonora, April to September.

CUPHEA WRIGHTII, *Gray, l. c. p.* 56. Between Babocomori and Santa Cruz, Sonora, September.

AMMANNIA LATIFOLIA, *Linn. Sp.* 1, *p.* 119; *Torr. & Gray, Fl.* 1, *p.* 480. Guadaloupe, Chihuahua, October; *Thurber.*

AMMANNIA WRIGHTII, *Gray, l. c. p.* 55. Wet places in valleys of the Limpio mountains, July; *Bigelow.* Margin of water holes, Sonora, September; *Thurber.*

ONAGRACEÆ.

ZAUSCHNERIA CALIFORNICA, *Presl. Rel. Hænk.* 2, *p.* 28, *t.* 52; *Torr. & Gray, Fl.* 1, *p.* 486. Sonora, September; *Thurber.*

EPILOBIUM COLORATUM, *Muhl. in Willd. Enum.* 1, *p.* 411. Between the Limpio and the Rio Grande; also at the Copper Mines, June to July; *Bigelow.* Valley of the Mimbres; *Thurber.* Cañon of Guadaloupe, Sonora, April; *Capt. E. K. Smith.*

ŒNOTHERA BIENNIS, *Linn.; Torr. & Gray, Fl.* 1, *p.* 492. Along the Rio Grande, from New Mexico to Laredo. Var. HIRSUTISSIMA, *Gray, Pl. Fendl. p.* 43. Chihuahua; *Thurber.*

ŒNOTHERA JAMESII, *Torr. & Gray, Fl.* 1, *p.* 493; *Gray, Pl. Lindh.* 2, *p.* 189. Borders of Devil's river, Texas.

ŒNOTHERA SINUATA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 494. Near the Copper Mines, July; *Bigelow.*

ŒNOTHERA ALBICAULIS, *Nutt. Gen.* 1, *p.* 245; *Gray, Pl. Wright.* 1, *p.* 69 *&* 2, *p.* 56. Sandhills along the upper Rio Grande, and valley of the Gila, common.

ŒNOTHERA CORONOPIFOLIA, *Torr. & Gray, Fl.* 1, *p.* 495. Banks of rivers, southern parts of New Mexico.

ŒNOTHERA ROSEA, *Ait.; DC. Prodr.* 3, *p.* 51. Valley of the Santa Cruz, Sonora, June; *Schott, Thurber.*

ŒNOTHERA MISSOURIENSIS, *Sims, Bot. Mag. t.* 1592; *Torr. & Gray, l. c. p.* 500. Valley of Devil's river, Texas, April; *Schott.*

ŒNOTHERA WRIGHTII, *Gray, Pl. Wright.* 2, *p.* 57. Rocky ravines near El Paso and Santa Barbara, April; *Bigelow, Thurber.*

ŒNOTHERA BRACHYCARPA, *Gray, Pl. Wright.* 1, *p.* 70; *&* 2, *p.* 57. Valley of the San Felipe, and near Frontera, western Texas, April; *Thurber, Bigelow.*

ŒNOTHERA TRILOBA, *Nutt.; Torr. & Gray, Fl.* 1, *p.* 499; *Gray, l. c.* Dry bed of Lake Gusman, northern Chihuahua, April; *Bigelow.*

ŒNOTHERA PRIMIVERIS, *Gray, Pl. Wright.* 2, *p.* 58. Sandy and gravelly places along the upper Rio Grande, and in northern New Mexico, March—April.

ŒNOTHERA MARGINATA, *Nutt., in Torr. & Gray Fl.* 1, *p.* 500. Santa Barbara, New Mexico; *Thurber.*

ŒNOTHERA SERRULATA, *Nutt.; Torr. & Gray, l. c., p.* 500. Western Texas, and in New Mexico, April to September.

ŒNOTHERA LAVANDULÆFOLIA, *Torr. & Gray, l. c.* Between Eagle Springs and Van Horn's well, Texas, June; *Bigelow.*

ŒNOTHERA HARTWEGI, *Benth. Pl. Hartw. p.* 1; *Gray, Pl. Wright.* 1, *p.* 72. Œ. Fendleri, *Gray, Pl. Fendl. p.* 45. On the Rio Grande and its tributaries, from El Paso to Eagle Pass; April—June.

ŒNOTHERA TUBICOLA, *Gray, Pl. Wright.* 1, *p.* 71. Gravelly places neart he Limpio, July; *Bigelow.*

ŒNOTHERA CHAMÆNERIOIDES, *Gray, Pl. Wright.* 2, *p.* 58. Frontera and Cook's Spring, Texas, April; *Bigelow.* San Bernardino and Santa Maria, Chihuahua, March; *Perry.*

ŒNOTHERA BISTORTA, *Nutt., in Torr & Gray, Fl.* 1, *p.* 508. San Pasqual, California, May; *Thurber.*

ŒNOTHERA GAURÆFLORA, *Torr. & Gray, Fl. p.* 510. Valley of the Gila, Sonora, May; *Schott.* Dry bed of a river near Monterey, California; *Dr. Andrews.*

ŒNOTHERA CLAVÆFORMIS, *Torr. & Frem. in Fremont's* 2 *Rep. p.* 314; *Torr. in Pacific Railroad Expl.* 5, *p.* 360. Colorado desert; *Schott.*

ŒNOTHERA CARDIOPHYLLA, *Torr. l. c.* With the last; *Schott.*

ŒNOTHERA VINOSA, *Lindl. Bot. Reg. t.* 1880. San Diego, California, May; *Thurber.*

ŒNOTHERA VIMINEA, *Dougl.* With the last, May; *Thurber.*

GAURA VILLOSA, *Torr. in Ann. Lyc. New York,* 2, *p.* 200. Mountain ravines and moist places near Rock creek, July; *Bigelow.*

GAURA DRUMMONDII, *Torr. & Gray, Fl.* 1, *p.* 518. On the lower Rio Grande, October, (in flower and fruit) *Schott.*

GAURA SUFFULTA, *Engelm. in Pl. Lindh.* 2, *p.* 190; *Gray, Pl. Wright.* 1, *p.* 72. Western Texas on the lower Rio Grande; *Schott.*

GAURA PARVIFLORA, *Dougl., Torr. & Gray, Fl.* 1, *p.* 519. Western Texas and New Mexico; also in the valley of the Gila, May—July.

GAURA COCCINEA, *Nutt., Torr. & Gray, l. c.*; *Gray, Pl. Wright.* 1, *p.* 73. Organ mountains, New Mexico, and down the valley of the Rio Grande to Eagle Pass, west to Sonora, April—July.

STENOSIPHON VIRGATUS, *Spach.*; *Monog. Onagr. Torr. & Gray, Fl.* 1, *p.* 520. Central Texas; *Thurber.*

EULOBUS CALIFORNICUS, *Nutt. in Torr & Gray, Fl.* 1, *p.* 515. Valley of the Gila, May; *Schott.* San Pasqual, California; *Thurber.*

JUSSIÆA REPENS, *Linn. Mant. p.* 381; *Torr. & Gray, l. c. p.* 520. Southwestern Texas and Sonora, April to October.

LUDWIGIA NATANS, *Ell. Sk.* 1, *p.* 581. Western Texas, October; *Bigelow.* Ojo Caliente, Chihuahua; *Thurber.* A form with much smaller leaves than usual, was found in the Limpio river, by *Bigelow.*

PROSERPINACA PALUSTRIS, *Linn. Torr. & Gray, Fl.* 1, *p.* 528. Pedro Pinta, Texas, October; *Bigelow.*

MYRIOPHYLLUM HETEROPHYLLUM, *Michx. Fl.* 2, *p.* 191. Ojo Caliente, Chihuahua; *Thurber.*

LOASACEÆ.

CEVALLIA SINUATA, *Lag. Nov. Gen. & Sp. p.* 11, *t.* 1; *Gray, Pl. Wright.* 1, *p.* 74. Common on hill sides along the Rio Grande; also, in Sonora, May to October.

PETALONYX THURBERI, *Gray, Pl. Thurb. p.* 319. (TAB. XVII.) Valley of the Gila, May—June, *Thurber; Schott.*

EUCNIDE BARTONIOIDES, *Zucc.; Gray, Pl. Lindh.* 2, *p*, 191. Cañons of the Rio Grande below San Carlos, August—October; *Parry.* Rocky places, Howard's Springs; *Bigelow.* Ringgold Barracks; *Schott.*

MENTZELIA ALBICAULIS, *Dougl.; Torr. & Gray, Fl.* 1, *p.* 534. Rocky hills on the upper Rio Grande and its tributaries, also in Sonora, March to September. Mountains east of San Diego, California; *Parry.* The oily seeds are pounded and used by the Indians as an ingredient of their *Piñolé mantica*, a kind of cake.

MENTZELIA WRIGHTII, *Gray, Pl. Fendl. p.* 48. Mountain ravines, Rock Creek, July; *Bigelow.* Valley of San Bernardino, Sonora, April; *Capt. E. K. Smith.*

MENTZELIA MULTIFLORA, *Nutt. Pl. Gamb. p.* 180; *Gray, Pl. Wright.* 1, *p.* 74. Hill sides along the Rio Grande, from El Paso downward to Laredo, April to July.

MENTZELIA OLIGOSPERMA, *Nutt. in Bot. Mag. t.* 1760; *Torr. & Gray, Fl.* 1, *p.* 533. Wet ravines on the Cibolo of the Rio Grande, July; *Bigelow.*

PASSIFLORACEÆ.

PASSIFLORA AFFINIS, *Engelm. in Gray, Pl. Lindh.*, 2, *p.* 233. Devil's river, Texas, October (in fruit); *Bigelow.*

PASSIFLORA TENUILOBA, *Engelm. l. c. p.* 192. High prairies and hill sides, Western Texas, along the Rio Grande, September, October; *Parry, Schott.*

PASSIFLORA FŒTIDA, *Linn. Amœn.* 1, *p.* 223, *t.* 19; *Sp. p.* 1359. Thickets, Eagle Pass, June; *Schott.* A variety which seems to be intermediate between P. fœtida, *Cavan.* and P. hibiscifolia, *Lam.*, having the leaves of the former and the pubescence of the latter. Mr. Schott found on the Sierra del Pozo Verde, in Sonora, a form with velvety pubescence, and almost 3-parted leaves, with the divisions more or less lobed and toothed.

PASSIFLORA MEXICANA, *Juss. Ann. Mus. p.* 108; *t.* 38, *DC. Prodr.* 3, *p.* 324. Tubac, Sonora; *Thurber.* Leaves glaucous, 2-lobed below the middle, the lobes moderately diverging, 1 to 1½ inch long from the bifurcation, marked near the base with a few round brownish glands. Flowers three-fourths of an inch in diameter, pale purple.

CUCURBITACEÆ.

SICYDIUM LINDHEIMERI, *Gray, Pl. Lindh.* 2, *p.* 194, *& Pl. Wright.* 1, *p.* 75. Presidio del Norte, July; *Parry.* Arroyos of the Limpia, *Bigelow.* Lower Rio Grande; *Schott.* Var. TENUISECTUM, *Gray, l. c.* Between the Leone and the Rio Grande; *Bigelow.* Mountains of Sonora; *Schott.*

CUCURBITA PERENNIS, *Gray, Pl. Lindh.* 2, *p.* 193. Plains between the Rio Grande and the Pecos, June—July; also at the Copper mines; *Bigelow.* Bottom lands of Devil's river, April to October; *Schott.* Grows in large patches; fruit the size and shape of a small orange.

CUCURBITA DIGITATA, *Gray, Pl. Wright.* 2, *p.* 60. Valleys among the mountains of Sonora, July (in flower;) *Schott.*

APODANTHERA? UNDULATA, *Gray, l. c.* Cañons of the Rio Grande, June; *Bigelow, Parry.* Santa Cruz, Sonora, June; *Schott, Thurber.* The Sonorians call the fruit of this plant *Melon de Cayota.*

CYCLANTHERA DISSECTA, *Arnott, in Hook. Jour. Bot.* 3, *p.* 280; *Gray, Pl. Wright.* 1, *p.* 75.

Alluvial borders of the Gila, May; *Schott.* Mountains and rocky places; Puerto de Paysano, Sonora, September (with flowers and young fruit); *Bigelow.*

ELATERIUM? WRIGHTII, *Gray, Pl. Wright. Fl.* 1, *p.* 61. Magdalena, Sonora, July; *Thurber.*

ELATERIUM? COULTERI, *Gray, l. c.* Hills near the Copper Mines, August, (in flower and fruit.) We fear not sufficiently distinct from the last. We have specimens which are almost equal in resemblance to both species.

CACTACEÆ.

The plants of this family, collected on the Boundary Survey, are described by Dr. Engelmann, in a separate article of this volume.

GROSSULACEÆ.

RIBES CALIFORNICUM, *Hook. & Arn.; Gray, in Bot. Whippl. Rep. p.* 88. Napa county, California, March; *Thurber.*

RIBES DIVARICATUM, *Dougl. in Hort. Trans.*, 7 *p.* 515; *Lindl. Bot. Reg. t.* 1559. In moist places, forming thick clumps, near Santa Barbara, California, March; *Parry.*

RIBES AUREUM, *Pursh, Fl.* 1, *p.* 164. Var. TENUIFLORUM. R. tenuiflorum, *Lindl. Bot. Reg. t.* 1274. Upper Rio Grande, and at the Copper Mines; also in Chihuahua and Sonora; March to April, Salinas river, California; *Parry.*

RIBES MENZIESII, *Pursh, Fl.* 2, *p.* 732. (TAB. XXIII.) Santa Barbara, California; *Parry.* A tall and handsome species.

RIBES SPECIOSUM, *Pursh, l. c.; Lindl. Bot. Reg. t.* 1557; *Torr. & Gray, Fl.* 1, *p.* 545. In ravines, from Monterey to San Diego, California, May; *Parry.* The most showy species of this genus. Its height is commonly from 6 to 8 feet.

RIBES MALVACEUM, *Smith in Rees Cyclop.; Torr. & Gray, Fl.* 1, *p.* 552. Common along the coast of California, particularly at Monterey and Santa Barbara, April; *Parry, Thurber.* A shrub with spreading branches, sometimes ten feet high. Flowers pale rose color; or in shady places, nearly white.

RIBES SANGUINEUM, *Pursh, Fl.* 1, *p.* 164; *Torr. & Gray, Fl.* 1, *p.* 551. San Pasqual, California, May; *Thurber.*

RIBES LEPTANTHUM, *Gray, Pl. Fendl. p.* 53, *& Pl. Wright.* 2, *p.* 63. Near the Copper Mines, and valley of the Mimbres, April; *Bigelow.*

CRASSULACEÆ.

SEDUM WRIGHTII, *Gray, Pl. Wright.* 1, *p.* 76. Hills and rocky places; Mount Carmel, Chihuahua, September and October; *Parry.* Mountains around the Copper Mines, and Puerto de Paysano; *Bigelow.*

SEDUM SPATHULÆFOLIUM, *Hook.; Torr. & Gray, Fl.* 1, *p.* 559. Rocky hills, Piñasquitas, California, May; *Thurber.*

SEDUM EDULE, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 560. Dry banks near the sea at San Diego, California; associated with Echeveria; *Parry.*

ECHEVERIA STRICTIFLORA, *Gray, Pl. Wright.* 1, *p.* 76. White rocks near Rock Creek, western Texas, July; *Bigelow.*

ECHEVERIA PULVERULENTA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 560. E. farinosa, *Lindl. in Lond. Hort. Jour.* 4, *p.* 292? Coronados Islands, California, May; *Thurber.*

ECHEVERIA LANCEOLATA, *Nutt. l. c.* (TAB. XXIV.) Dry clay banks near the sea, at San Diego, California, June; *Parry.* Coronados islands; *Thurber.*

SAXIFRAGACEÆ.

SAXIFRAGA PARRYI (n. sp.): caudice subterraneo tuberoso ovato; foliis radicalibus suborbiculato-cordatis inciso-lobatis, lobis dentatis; venis subtus petiolisque pubescentibus; scapis nudis gracilibus; floribus paucis laxe paniculatis; calycibus campanulatis liberis, dentibus brevibus; petalis lanceolatis brevi unguiculatis, stylis ovario subæqualibus in fructu divergentibus. (TAB. XXV.) Dry hills near San Diego and San Luis Rey, California, November—December; *Parry.* Tuber about the size of a hazel-nut, fleshy. Leaves all radical, and withering away soon after the flowers appear, about an inch in diameter, slightly pubescent above; petiole nearly as long as the lamina. Scapes 4–8 inches high, commonly 2–4 from each tuber, a little pubescent. Flowers 4–7 in a loose panicle or cyme. Calyx marked with 10 strong dark brown nerves, the teeth triangular, rather obtuse, and about half the length of the tube. Petals white, nearly twice the length of the calyx teeth. Stamens 10; filaments subulate, the alternate ones rather shorter than the others. Carpels united below, rostrate and diverging above, pointed with the slender styles, which are as long as the beaks. Seeds dull, angularly 4-ribbed. A remarkable species, with the calyx and habit of a small Heuchera, but it is decandrous and the ovary is wholly free as well as 2-celled.

SAXIFRAGA VIRGINIENSIS, *Michx. Fl.* 1, *p.* 269? Cyme very few-flowered, but in other respects like the eastern plant. Near San Diego, California; *Parry.*

HEUCHERA MICRANTHA, *Dougl. in Bot. Reg. t.* 1302; *Torr & Gray, Fl.* 1, 579. Ravines near Monterey, California, May; *Parry.*

HEUCHERA RUBESCENS, *Torr. in Stansb. Rep. p.* 388, *t.* 5; *Gray, Pl. Wright.* 2, *p.* 63. Organ mountains, New Mexico, November, (in fruit;) *Bigelow.*

HEUCHERA PARVIFOLIA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 581, *Gray, l. c. p.* 64. Copper Mines, New Mexico, August; *Bigelow.*

LITHOPHRAGMA CYMBALARIÆ, *Torr. & Gray, Fl.* 1, *p.* 585. Shady ravines near Santa Barbara, California, March; *Parry.*

LITHOPHRAGMA HETEROPHYLLA, *Hook. & Arn.; Torr. & Gray. l. c.* Near Monterey, California, March—May; *Parry.* Napa Valley; *Thurber.*

LEPUROPETALON SPATHULATUM, *Ell. Sh.* 1, *p.* 370; *Torr. & Gray, l. c. p.* 390. Santa Cruz, Sonora, March; *Parry.*

FENDLERA RUPICOLA, *Engelm. & Gray, Pl. Wright. p.* 77, *t.* 5. Organ mountains, New Mexico, and rocky places along the Rio Grande, down to the Presidio, March—May.

PHILADELPHUS SERPYLLIFOLIUS, *Gray, Pl. Wright.* 1, *p.* 77. Mountains and rocky places on the Rio Limpio, Texas, and at the Copper Mines, June—July; *Bigelow.* Sonora, April; *Capt. E. K. Smith.*

UMBELLIFERÆ.

HYDROCOTYLE UMBELLATA, *Linn. Sp. p.* 234; *Torr. & Gray, Fl.* 1, *p.* 599. Rio San Antonio, Texas; *Schott.* Devil's river, September; *Bigelow.* Bachuachi, Sonora, June; *Thurber.*

HYDROCOTYLE NATANS, *Cyrill.; Torr. & Gray, l. c.* C. prolifera, *Kellogg, Proc. Calif. Acad. Nat. Sc.* 1, *p.* 15. Borders of brooks, Monterey, &c., California; *Parry.*

HYDROCOTYLE RANUNCULOIDES, *Linn. f.*; *Torr. & Gray. l. c.* Fronteras, Sonora, May; *Thurber.*

BOWLESII LOBATA, *Ruiz & Pav.*; *Torr. & Gray, l. c. p.* 601. Moist shady places, near San Diego and Monterey, California; March—April; and on the Rio Gila; *Parry.*

SANICULA MENZIESII, *Hook. & Arn. Bot. Beechey, p.* 347; *Torr & Gray, l. c. p.* 602. Ravines near Monterey, California, April; *Parry.*

SANICULA BIPINNATIFIDA, *Dougl. in Hook. Fl. Bor.-Am.* 1, *p.* 258, *t.* 92. White Oak plains north of San Luis Obispo, and in other parts of California, March—April; *Parry.*

SANICULA LACINIATA, *Hook. & Arn. Bot. Beech. p.* 347. S. nudicaulis, *Hook. & Arn. l. c.* Monterey, California; *Parry.*

SANICULA ARCTOPOIDES, *Hook. & Arn. l. c.*; *Hook. Fl. Bor.-Am.* 1, *p.* 258, *t.* 91. Monterey, California, April; *Parry.*

ERYNGIUM LEAVENWORTHII, *Torr. & Gray, Fl.* 1, *p.* 604. Plains and rocky places between Devil's river and the Rio Grande, September; *Bigelow.* Piedras Pintas, western Texas; *Schott.*

ERYNGIUM WRIGHTII, *Gray, Pl. Wright.* 1, *p.* 78. Western Texas, on the Rio Grande, June; *Schott, Bigelow.* Sonora, June—September; *Thurber, Capt. E. K. Smith.*

ERYNGIUM DIFFUSUM, *Torr. in Ann. Lyc. N. York*, 2, *p.* 207, *& in Marcy Rep. p.* 286, *t.* 6. On the lower Rio Grande, May; *Schott.*

BERULA ANGUSTIFOLIA, *Koch; Gray, Pl. Fendl. p.* 55, *& Pl. Wright*, 2, *p.* 65. Marshes of the Limpio, Texas; and at the Copper Mines, July, (in flower and fruit;) *Bigelow.* Tucson, Sonora, May; *Schott.*

LEPTOCAULIS ECHINATUS, *Nutt. in DC. Prodr.* 4, *p.* 107; *Torr. & Gray, Fl.* 1, *p.* 609. Plains between Fort Fillmore and the Organ mountains, and mountains near Lake Santa Maria, Chihuahua, April; *Bigelow.* On the lower Rio Grande; *Schott.* Sonora; *Parry.*

CICUTA MACULATA, *Linn.; Torr. & Gray, Fl.* 1, *p.* 610. Shady moist places on the Limpio and Mimbres, July; *Bigelow, Thurber.*

DAUCOSMA LACINIATUM, *Engelm. & Gray, Pl.* 2, *p.* 210. Western Texas, October, (in fruit;) *Thurber.* Copper Mines; *Bigelow.*

CYMOPTERUS MONTANUS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 624; *Gray, Pl. Fendl. p.* 56; *& Pl. Wright.* 1, *p.* 79.

CYMOPTERUS FENDLERI, *Gray, Pl. Fendl. p.* 57? On the upper Rio Grande, Texas, and Chihuahua; *Bigelow, Parry.*

THASPIUM? MONTANUM, *Gray, Pl. Fendl. p.* 57, var. TENUIFOLIUM, *Gray, Pl. Wright.* 2, *p.* 65. At the Copper Mines, New Mexico, June, (in flower;) *Bigelow.*

PEUCEDANUM DASYCARPUM, *Torr. & Gray, Fl.* 1, *p.* 628. Southern California: the particular station not recorded; *Parry.* The fruit is nearly twice as large as in Douglas' original specimen, but in other respects his plant resembles ours.

PEUCEDANUM PARVIFOLIUM, *Torr. & Gray, l. c.* Pine woods near Monterey, California, April (in flower, and with nearly mature fruit); *Parry.* Specimens from the same place, collected by Major Wm. Rich, have ripe fruit, which is nearly orbicular, from the unusual breadth of the winged margins.

PEUCEDANUM FŒNICULACEUM, *Nutt. in Torr. & Gray, l. c.?* San Luis Rey, California; *Parry.* We cannot be certain of the species, for want of the fruit. The divisions of the leaves are broader than in the ordinary forms of this species.

DEWEYA ARGUTA, *Torr. & Gray, l. c. p.* 641. Near Santa Barbara; *Parry.* (TAB. XXVI.)

EURYPTERA LUCIDA, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 629. (TAB. XXVII.) Gravelly hills north of San Diego, California, March; *Parry.*

HERACLEUM LANATUM, *Michx. Fl.* 1, *p.* 166; *Torr. & Gray, l. c. p.* 632. Borders of rivulets near Monterey, California, May, (in flower); *Parry.*

DAUCUS PUSILLUS, *Michx.* var. SCABER, *Torr. & Gray, l. c. p.* 636.

OSMORHIZA OCCIDENTALIS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 639. Pine woods, Monterey, California; *Parry.*

OSMORRHIZA BRACHYPODA, *Torr. in Jour. Acad. Nat. Sc. Phil. n. ser.* 2, *p.* 79. *Torr. Pl. Whippl. p.* 93. With the last; *Parry.*

APIASTRUM ANGUSTIFOLIUM, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 644. (TAB. XXVIII.) Dry grassy hills, San Luis Rey, California; *Parry.*

CORNACEÆ.

CORNUS PUBESCENS, *Nutt. in Torr. & Gray, Fl.* 1, *p.* 652 (sub var. C. sericea,) *& Sylv.* 3, *p.* 54. *Torr. in Bot. Whippl. Rep. p.* 95. San Luis Obispo and San Luis Rey, California; *Parry.* A shrub 10 to 12 feet high.

CORNUS NUTTALLII, *Audubon, Birds of Amer. t.* 367; *Torr. & Gray, l. c.; Nutt. Sylv.* 3, *p.* 51, *t.* 97. Monterey, California; *Parry.*

CAPRIFOLIACEÆ.

LONICERA DUMOSA, *Gray, Pl. Wright.* 2, *p.* 66. Hills at the Copper Mines, New Mexico; June, (in flower); and on the Limpio, July, (in fruit); *Bigelow.* Hills near the Mimbres, May; *Thurber.* Santa Cruz mountains; Sonora; *Capt. E. K. Smith.* "A luxuriant vine." Corolla pale greenish yellow, ringent, about three-fourths of an inch long, the tube slender, not gibbous. Filaments smooth, except at the base. Style hairy. Except in the pubescence I see little to distinguish this from L. albiflora.

LONICERA INVOLUCRATA, *Banks; Torr. & Gray, Fl.* 2, *p.* 9. Monterey and other parts of California, April; *Parry, Thurber.* Stem 6 to 8 feet long, usually reclining on other plants. Leaves somewhat persistent. Flowers red and orange. Berries black.

LONICERA SUBSPICATA, *Hook. & Arn. Bot. Beechey, p.* 349; *Torr. & Gray, l. c.* (TAB. XXIX.) Bushy places on the mountains east of San Diego, California, June; *Parry.* Plant 3 to 4 feet high. Flowers yellowish.

SYMPHORICARPUS MOLLIS, *Nutt. in Torr. & Gray, Fl.* 2, *p.* 4. Woods near Monterey, California, April; *Parry.*

SYMPHORICARPUS ROTUNDIFOLIUS, *Gray, Pl. Wright.* 2, *p.* 66. Organ mountains, New Mexico; *Parry.* Hills at the Copper Mines, August, (flowers and fruit); *Bigelow.* A form with perfectly smooth and glaucous leaves was found near the Mimbres by Dr. Bigelow.

SAMBUCUS GLAUCA, *Nutt. in Torr. & Gray, Fl.* 2, *p.* 13. Var. foliis anguste lanceolatis, *Gray, Pl. Wright. l. c.* Sides of Ben Moore, near the Copper Mines, June; *Bigelow.* Not very distinct from the next.

SAMBUCUS MEXICANA, *Presl; DC. Prodr.* 4, *p.* 323; *Gray, Pl. Wright. l. c.* Banks of the Rio Grande, near El Paso, where it becomes a low tree, 12 inches in diameter at the base; *Bigelow.* Near Monterey, California, sometimes 25 feet high, August; *Parry.* Mabibi, Sonora; *Thurber.*

RUBIACEÆ.

Galium Aparine, *Linn. Sp. p.* 108. Sonora, June; *Thurber.*

Galium asperimum, *Gray, Pl. Fendl. p.* 60. Wet ravines, Organ mountains, New Mexico, April; *Bigelow.* Annual. Leaves 6 to 8 in a whorl. Not very distinct from G. Aparine.

Galium Californicum, *Hook. & Arn. Bot. Beech. p.* 349; *Torr. & Gray, Fl.* 2, *p.* 20. Pine woods near Monterey, California; *Parry.*

Galium proliferum, *Gray, Pl. Wright.* 2, *p.* 67. Rocky hills, El Paso, April.

Galium microphyllum, *Gray, Pl. Wright.* 1, *p.* 81. Rocky places and sides of mountains along the upper Rio Grande, and at the Copper Mines, April.

Galium suffruticosum, *Nutt. in Torr. & Gray, Fl.* 2, *p.* 21. San Diego, California; *Thurber.*

Galium Wrightii, *Gray, Pl. Wright.* 1, *p.* 80. Burro mountains, and Mountains of Muerte; also on the Rio Grande, 70 miles below El Paso. The upper leaves, and sometimes the lower also, are merely scabrous, and not hairy.

Cephalanthus occidentalis, *Linn.; Torr. & Gray, Fl.* 2, *p.* 31. Valley of the Rio Grande and westward to California, June—August.

Bouvardia hirtella, *H. B. K. Nov. Gen. & Sp.* 3, *p.* 384; *Gray, Pl. Wright.* 1, *p.* 80. Cañons of the Rio Grande, June—July; *Parry, Bigelow.*

Oldenlandia angustifolia, *Gray, Pl. Wright.* 2, *p.* 68. Rocky places along the Rio Grande and its tributaries, from El Paso downward, June—August Sonora; *Thurber.* An extremely variable species.

Oldenlandia acerosa, *Gray, Pl. Wright. l. c.* Hedyotis acerosa, *Gray, Pl. Wright.* 1, *p.* 81. Dry hill-sides, Devil's river and along the Rio Grande, September—October.

Oldenlandia rubra, *Gray, l. c.* Hedyotis rubra, *Cavan.* Hills at the Copper Mines, June; *Bigelow.*

Oldenlandia humifusa, *Gray, l. c.* Hedyotis humifusa, *Gray, Pl. Lindh.* 2, *p.* 216. Sand hills, Western Texas; *Bigelow.*

Diodia teres, *Walt. Fl. Car. p.* 87; *Torr. & Gray, Fl.* 2, *p.* 29. On the lower Rio Grande; *Schott.*

VALERIANACEÆ.

Valeriana sylvatica, *Richards. App. Frankl. Journ. ed.* 2, *p.* 2; *Torr. & Gray, Fl.* 2, *p.* 47. Hills at the Copper Mines, April, May; *Bigelow.*

Valeriana edulis, *Nutt. in Torr. & Gray, Fl. l. c.; Gray, Pl. Fendl. p.* 61. V. ciliata, *Torr. & Gray, l. c.* Six miles west of the Copper Mines, April, May; *Bigelow.*

Plectritis congesta, *Lindl.; DC. Prodr.* 4, *p.* 631. Monterey and east of San Diego, California, April; *Parry.*

COMPOSITAE, (by A. Gray.)

Vernonia Jamesii, *Torr. & Gray, Fl.* 2, *p.* 58; *Gray, pl. Wright*, 1, *p.* 82, *&* 2, *p.* 69; *& in Bot. Whipp. Rep. R. R. Surv. p.* 95. Common in western Texas.

Vernonia Lindheimeri, *Gray & Engelm., Pl. Lindh.* 2, *p.* 217. Southern Texas.

Pectis angustifolia, *Torr. in Ann. Lyc.*; *Gray, Pl. Wright, l. c., etc.* Pectidopsis angustifolia, *DC.* Dry hills, western Texas to the Copper Mines, New Mexico, etc., and south to the Rio Grande. According to Mr. Thurber, the fresh plant exhales the odor of lemon balm.

Pectis filipes, *Harv. & Gray, in Pl. Fendl. p.* 62; *Gray, Pl. Wright*, 2, *p.* 69. Gathered by all the collectors; apparently common from the Rio Grande to Chihuahua and western Sonora.

Pectis papposa, *Harv. & Gray, l. c.* This has now been traced nearly across the continent, from Presidio del Norte (*Bigelow, Parry, etc.*) to the Gila and Cocospera, (*Schott, Thurber, etc.*)

Pectis longipes, *Gray, Pl. Wright*, 2, *p.* 70. Santa Cruz, Sonora, and vicinity; found by all the collectors. Berlandier collected it in Nuevo Leon; it is No. 3159 of my distribution of his *reliquiæ*.

Pectis imberbis, *Gray, l. c.* Besides Wright's specimens, gathered on the Sonoita, Sonora, from which this remarkable species was characterized, it was also found at Janos, Chihuahua, and elsewhere by Schott.

Pectis prostrata, *Cav.; Gray, Pl. Wright*, 1, *p.* 83. New Mexico and Sonora; *Wright, Thurber.*

Pectis tenella, *DC. Prodr.* 5, *p.* 99. Rio Coleto, Texas, *Thurber.* It was gathered by Berlandier at Laredo, and between the Rio Grande and the Nueces, and is No. 599, 985, 2009, and 2415 of the American distribution.*

Isocarpha oppositifolia, *R. Br.; DC. Prodr.* 5, *p.* 107. On the lower Rio Grande; *Schott, etc.* A congener of Dunantia, *DC.*, as Mr. Bentham has shown, (in *Bot. Voy. Sulphur.*) He has indicated the practical difficulties in the nomenclature of the two genera.

Trichocoronis rivularis, *Gray, Pl. Fendl. p.* 56. Piedra Pinta Creek, Texas. *Wright, Parry.*

Stevia canescens, *Benth. Pl. Hartw. p.* 19 (an *H. B. K?*) *Gray, Pl. Wright*, 2, *p.* 71. A smoothish form, gathered both in New Mexico and Santa Cruz, Sonora, by *Wright & Thurber.*

Stevia salicifolia, *Cav. Ic. t.* 354.; Lower Rio Grande; *Parry.* Pappus either 1–2-aristate, or else short and awnless, where it apparently passes into S. angustifolia, *H. B. K.*

Stevia micrantha, *Lag. Nov. Gen. & Sp. p.* 27. S. macella, *Gray, Pl. Wright*, 2, *p.* 70. Cobre (Copper Mines,) New Mexico; *Wright.* This being the same as a plant collected by Schaffner on Chepultepec, and kindly communicated to me by Dr. Schultz, the distinguished investigator of Compositæ, under the name of S. micrantha, I do not hesitate to restore that name, although the specimens do not altogether accord with Lagasca's brief character.†

---

*Pectis Berlandieri, *DC. l. c.* (between Tantoyuca and Tampico, 732, 2152; San Fernando, Cohahuila, 1537, 3037, *Berlandier.*) has not yet been re-discovered. The setae of the pappus, both of the disk and ray, vary from three to six.

† In the portion of the collections of Berlandier, until now undistributed, occurs the following:

Stevia Berlandieri (sp. nov.): fruticosa, fere glabra; foliis oppositis ovatis obovatisve obtusis in petiolum longum contractis basi triplinerviis crenato-subserratis crassiusculis, summis parvis spathulatis integerrimis; corymbo polycephalo pedunculato; capitulis brevissime pedicellatis capitato-congestis; involucri squamis atomiferis subacutis; acheniis glaberrimis; pappo exaristato e squamis truncatis laceris coroniformi-subconcretis.

In the mountains near San Carlos, Tamaulipas; Berlandier, No. 3160. Mountains near Saltillo; *Gregg*, No. 224. Suffruticose, a foot or two high, leaves half an inch to an inch long, with a petiole of 1½—6 lines in length, smooth and glabrous, nearly veinless except the triple ribs at the base. Heads 3½ or 4 lines long, including the flesh-colored or whitish corolla.

CARPHOCHAETE BIGELOVII, *Gray, Pl. Wright*, 1, *p.* 89, 2, *p.* 71. New Mexico to Santa Cruz, Sonora; *Bigelow, Wright, Parry.* Sierra San Luis; *E. K. Smith.*

CARMINATIA TENUIFLORA, *DC. Prodr.* 7, *p.* 267; *Deless. Ic. Sel.* 4, *t.* 99; *Gray, l. c.* Copper Mines to Western Sonora.

KUHNIA EUPATORIOIDES, *Linn.* Narrow leaved forms, mostly var. GRACILLIMA, which abounds in New Mexico and Sonora, extends far into Mexico, and perhaps is K. rosmarinifolia.

LIATRIS PUNCTATA, *Hook. Fl. Bor.-Am.* 1, *p.* 306, *t.* 105. L. mucronata, *DC.* Mountains of the Limpia, and Salveto Creek, Texas; *Bigelow, Parry.*

CARPHEPHORUS JUNCEUS, *Benth. Bot. Sulph.*, *p.* 21. Diluvial banks of the Colorado of the West, in dry and sandy beds of ravines; *Schott.*

PEUCEPHYLLUM, Nov. Gen. Eupatoriacearum.

Capitulum pluri-(10–16)-florum. Involucrum circiter 12–phyllum, disco brevius, laxum; phyllis vix biseriatis lineari-subulatis, inferne carinato-concavis margine tenuiter scariosis, superne foliiformibus. Receptaculum planum nudum. Corollæ longe cylindricæ, fauce non ampliatæ, 5–dentatæ, dentibus ovatis patentibus. Styli rami lineares, plano-convexi, obtusissimi, prorsus minutim glandulosi. Achenia haud matura subturbinata, teretia, hirsutissima. Pappus capillaris, setis rigidulis pluriserialibus valde inaequalibus denticulatis, longioribus corollam subaequantibus. Fruticulus ramosus, glanduloso-viscidulus; ramis monocephalis usque ad apicem foliosis; foliis acerosis punctatis alternis; floribus lutescentibus.

PEUCEPHYLLUM SCHOTTII.—Diluvial banks of the Colorado, in Sonora; February; *Schott.* Stems a span high, loosely branched. Leaves crowded, an inch or less in length, filiform, obtuse, glabrous, but glandular when young and more or less glutinous, strongly glandular-punctate. Head cylindraceous, half an inch long. Scales of the involucre obscurely one-nerved, the alternate and exterior ones rather smaller than the others. Corolla glandular at the summit. I know of no published genus to which this manifestly Eupatoriaceous plant is particularly allied. The name alludes to the acerose, fir-like foliage.

BRICKELLIA OLIGANTHES, *Gray, Pl. Wright*, 1, *p.* 84, *&* 2, *p.* 71. Santa Cruz, Sonora; *Wright, Thurber.*

BRICKELLIA VERONICÆFOLIA, *Gray, l. c.* Sonora; *Schott;* the habitat not recorded. This is an abundant species in Northern Mexico. It is distributed under eight different numbers in Berlandier's collection.

BRICKELLIA LACINIATA, *Gray, Pl. Wright*, 1, *p.* 87. Bachimba; *Thurber.* Organ mountains; *Bigelow.* On the Rio Grande; *Parry.* Dr. Schultz, in Seemann's *Botany of the Herald*, p. 301, has applied to this species the name of B. dentata, *Schultz, mss.*, supposing it to be De Candolle's Clavigera dentata, having overlooked my statement, in *Pl. Wright*, 1, p. 83, that the plant of De Candolle is B. Riddellii, and that the present species was not described in De Candolle's Prodomus. It is 1365 and 1783 of Berlandier's collection.

BRICKELLIA SIMPLEX, *Gray, Pl. Wright*, 2 *p.* 73. Babocomori to Santa Cruz, Sonora. At Bufotillo Ranch, Dr. Bigelow gathered specimens of a Brickellia with the foliage of B. simplex, and with a similar involucre, but the heads are small and more numerous.

BRICKELLIA WISLIZENI, *Gray, Pl. Fendl. p.* 64, *& Pl. Wright, l. c.;* Santa Cruz; Sonora; *Bigelow, Wright, &c.*

BRICKELLIA BETONICÆFOLIA, *Gray, Pl. Wright*, 2, *p*. 72. Cobre, etc., New Mexico; *Wright, Bigelow;* var. HUMILIS. Between Babocomori and Santa Cruz, Sonora; *Thurber, Wright.*

BRICKELLIA CYLINDRACEA, *Gray, Pl. Lindh.* 2, *p*. 218, *& Pl. Wright, l. c.* Western Texas, the Rio Grande near Eagle Pass, etc.; *Bigelow, Parry.*

BRICKELLIA RIDDELLII, *Gray, l. c.* Southern and western Texas, where it abounds.

BRICKELLIA WRIGHTII, *Gray, Pl. Wright*, 2, *p*. 72. Cobre, etc., New Mexico; *Wright.* Santa Cruz, Sonora; *Thurber.*

BRICKELLIA TENERA, *Gray, l. c.* Near Santa Cruz, Sonora, in a mountain ravine; *Wright.*

BRICKELLIA FLORIBUNDA, *Gray, l. c.* With the last, and also on the San Pedro, Sonora; *Wright.*

BRICKELLIA RENIFORMIS, *Gray, Pl. Wright*, 1, *p*. 86. Punto de Peysano; *Bigelow.*

BRICKELLIA BACCHARIDEA, *Gray, l. c.* Cobre, New Mexico; *Bigelow.*

BRICKELLIA GRANDIFLORA, *Nutt.*; *Torr. & Gray, Fl. l. c.* Cobre, New Mexico; *Bigelow, Wright.*

EUPATORIUM PARRYI (sp. nov): glanduloso-hirsutum, ramosum; foliis alternis nunc oppositis cordatis acutis grosse inciso-crenatis membranaceis subtriplinerviis venosis; petiolo elongato marginato; corymbis circiter 5-cephalis; pedunculis gracilibus; capitulis circiter 20-floris cylindraceis, squamis imbricatis triseriatis lanceolatis striatis aristato-acuminatis extus pubescentibus; acheniis ad angulos hirtellis.—Sierra de Carmel, near the Rio Grande, Chihuahua; October; *Parry.* Branches of an herbaceous species, apparently of a diffuse habit, which has the involucre and habit of a *Brickellia* (but the achenia are pentangular without intermediate striæ,) or of an *Ooclinium*, but the receptacle is flat. Leaves about an inch in length and breadth, deltoid-cordate, beset with a sparse and short pubescense or glabrate. Petioles 6 to 8 lines long, with narrow decurrent margins, hirsute with glandular or viscid hairs, like the stem, peduncles, etc. Peduncles minutely bracteolate. Heads half an inch long. Scales of the involucre green, lucid, appressed, strongly striate, tapering, especially the inner ones, into a slender short awn. Flowers apparently ochroleucous. Achenia 2 lines long, with a conspicuous basilar callus, slender. Pappus white, scabrous.

EUPATORIUM BIGELOVII (sp. nov): cinereo-pubescens, ramosum; foliis oppositis ovato-lanceolatis acutis integerrimis breviter petiolatis a basi rotundata tri-quinquenervatis supra glabratis subtus tomentosis; capitulis ternis quinisve ad apicem ramulosum brevi-pedicellatis 20–30-floris; involucro turbinato cinereo-tomentoso; squamis pluriseriatim imbricatis striatis, acutis, exterioribus ovatis oblongisve, interioribus lanceolatis seu linearibus purpurascentibus; acheniis secus angulos scabridis.—On the Gila, Sonora; *Parry.* Apparently an upright herbaceous plant, also with much the aspect of a Brickellia, but with the characters of Eupatorium. Leaves 2 or 3 inches long, thin, the larger an inch or more in width near the base, thence tapering to an acute point. Petioles 3 lines long. Heads half an inch long. Scales of the turbinate and tomentose involucre rather loosely imbricated in 5 or 6 series, the exterior successively shorter and broader. Flowers purplish. Pappus tinged with purple or brownish. Achenia a line and a half long.*

---

* EUPATORIUM SPINACIÆFOLIUM is the name which must apparently be borne by Bulbostylis spinaciæfolia, *DC. Prodr.* 5, *p*. 139, since it has pentagonal achenia and is a true Eupatorium. The species is founded on Berlandier's Nos. 764 and 2184 (Amer. distrib.) My specimens have only upper leaves, few of which are much hastate.

Eupatorium Schiedeanum, *Schrad.*; *DC. Prodr.* 5, *p.* 159. (E. multinerve, *Benth.* E. Schiedeanoides, *Schultz, Bip.*:) var. grosse-dentatum. E. Sonorae, *Gray, Pl. Wright,* 2, *p.* 74. Mountain ravine near Santa Cruz, Sonora; *Wright.* Lower Rio Grande, Texas, near Ringgold's Barracks, etc.; *Schott.* The latter is a more diffuse and loosely flowered form, approaching E. paniculatum, *Schrad.*, in the inflorescence, but not in the leaves. The form with dense corymbs which comes from southern Mexico, Costa Rica, etc., Dr. Schultz has ascertained to be Lessing's E. pycnocephalum, a name not very appropriate for our forms nor for the specimens of Berlandier. The plant of the Rio Grande is said by Mr. Schott to exhale a moschate odor.

Eupatorium Berlandieri, *DC. Prodr.* 5, *p.* 167. E. ageratifolium β? Mexicanum, *DC. l. c. p.* 173. E. ageratifolium, var. Texense and var. herbaceum, *Gray Pl. Lindh. & Pl. Wright.* Various forms from southern Texas to the mountains near Santa Cruz, Sonora, (the nearly herbaceous state.) In Berlandier's *reliquiæ* distributed by me, this occurs under the numbers 762 and 2182, (between Victoria and Tula,) and 756, 2176, (between Tula and Tampico;) also from San Carlos, Tamaulipas, 3164. These all belong to one species, and the difference in the length of the pappus remarked by De Candolle is inconstant. The name of E. Berlandieri had best be retained for the species, at least until it is identified with the Cuban species.

Eupatorium Wrightii, *Gray, Pl. Wright,* 2, *p.* 87. New Mexico; *Wright.*

Eupatorium solidaginifolium, *Gray, l. c.* New Mexico; *Wright,* &c.

Eupatorium serotinum, *Michx.* San Pedro river, western Texas; *Bigelow.*

Eupatorium conyzoides, *Vahl. Symb.* 3, *p.* 96. Lower Rio Grande; *Schott.* Rocky ravines, near Santa Rosa; *Bigelow.* Mr. Trecul gathered this at the mouths of the Mississippi. De Candolle's Mexican stations are from Berlandier's collections, in which it occurs under numbers 1384, 2210, 2355, etc. The original colored drawing (in my possession) for the plate in Schrank's *Pl. Rar. Hort. Monac.*, *t.* 85, represents the flowers as white or whitish.*

Conoclinium cœlestinum, *DC. Prodr.* 5, *p.* 135. Rio Grande, near Laredo, *Schott.*

Conoclinium betonicum, *DC. l. c.* Lower Rio Grande, *Schott.* A nearly glabrous form, with hastate-oblong and very obtuse leaves. Also a remarkable and doubtful form, with thin, glabrous, and entire ovate leaves from near the mouth of the Pecos. Perhaps the species, which seems to be polymorphous, likewise includes C. Hartwegi, *Walp.*, the Eupatorium Hartwegi, *Benth. Pl. Hartw.*

Conoclinium dissectum, *Gray, Pl. Wright,* 1, *p.* 88. From the lower Rio Grande to the borders of Sonora; found by all the collectors. It is singular that this does not occur in Berlandier's collection.

Mikania scandens, *Linn.* Southern Texas, *Schott.* &c.

Corethrogyne incana, *Nutt.* (excl. syn.) San Diego, California; on hills; *Parry.* Probably this is no more than a state of C. Californica, without chaff on the receptacle.

Corethrogyne filaginifolia, *Nutt.; Torr. & Gray, Fl.* 2, *p.* 98. There is a great deal of confusion in the description and synonymy of this and C. tomentella in the Flora of North

---

* Eupatorium azureum, *DC. l. c. p.* 168, No. 1380 of Berlandier's colletion, was also gathered by Dr. Gregg at Monterey, in better specimens. The heads are 30–40-flowered; the corolla purplish, according to Gregg; and the leaves are broadly deltoid. The species is allied to E. deltoideum, but the leaves are not hastate, the heads are shorter and smaller, the involucre more biseriate, its outermost scales broader, and the achenia nearly glabrous.

America and elsewhere, which it is now hardly worth while to clear up in detail, since it is evident that the two really belong to one polymorphous species, which includes Bentham's C. virgata and C. obovata also. The plant has a persistent base, and blossoms at various seasons; the wool is either permanent or deciduous, etc. Should my conjecture about C. incana prove true, the known forms of the genus may be reduced to two species, C. Californica and C. filaginifolia.

MACHÆRANTHERA CANESCENS, *Gray, Pl. Wright.* 1, *p.* 89, &c. Along the boundary everywhere, from the upper part of the Rio Grande to the Gila, &c.

MACHÆRANTHERA TANACETIFOLIA, *Nees. Ast. p.* 224; *Gray, l. c.* From the Pecos to Sonora, etc.; in various forms.

MACHÆRANTHERA PARVIFLORA, *Gray, l. c.* Plains and mountains, southern borders of New Mexico and adjacent parts of Sonora; also on the Gila; *Bigelow, Parry, Wright, Thurber.*

PSILACTIS ASTEROIDES, *Gray, Pl. Fendl. p.* 72. Along the Rio Grande, from Presidio to El Paso, etc., and in Sonora.

ASTER MULTIFLORUS, *Ait.* Common from the lower Rio Grande to the Gila, etc. A. hebecladus and A. scoparius, *DC.*, are founded on exactly the same thing in Berlandier's collections.

ASTER SIMPLEX, *Willd.* Sonora; *Wright.* On the Mimbres, New Mexico; *Bigelow.*

ASTER CARNEUS, *Nees.* A. cœrulescens, *DC. Prodr.* 5, *p.* 235. Western Texas; *Thurber*. On the Pecos; *Bigelow.*

ASTER PUNICEUS, *Linn.;* var. VIMINEUS, *Torr. & Gray.* Mimbres; *Bigelow.* Sierra de los Animos; *Wright.*

ASTER LONGIFOLIUS, *Lam.* On the Mimbres; *Wright.*

ASTER NOVI-BELGII, *Linn.* Also on the Mimbres, etc.; *Wright, Bigelow.*

ASTER SPINOSUS, *Benth. Pl. Hartw. p.* 20. Along the Rio Grande, below El Paso, to its mouth.

ASTER DIVARICATUS, *Nutt.* From the lower Rio Grande to Sonora.

ASTER ANGUSTUS, *Torr. & Gray, l. c.* Sand bars of the Rio Grande, below Doña Ana; *Wright, Bigelow.* Probably brought down the river from the Rocky mountains.

ASTER PAUCIFLORUS, *Nutt.; Gray, Pl. Wright,* 2, *p.* 76. Subsaline soil, west of the Chiricahui mountains and Santa Cruz, Sonora; *Wright.*

ASTER BLEPHAROPHYLLUS, *Gray, Pl. Wright, l. c.* Subsaline soil, Los Playos Springs, New Mexico; *Wright.*

ASTER SONORÆ, *Gray, Pl. Wright, l. c.* In the same region as the last two species.

ASTER CHILENSIS, *Nees.;* var. *β. Torr. & Gray, Fl.* 2, *p.* 112. A. Durandi, *Nutt. in herb.* California; *Rev. Mr. Fitch.*

ERIGERON (CŒNOTUS) CANADENSE, *Linn.* On the Gila; *Thurber;* and doubtless almost everywhere.

ERIGERON (CŒNOTUS) ERIOPHYLLUM, *Gray, Pl. Wright,* 2, *p.* 77. On the Sonoita, Sonora; *Wright.*

ERIGERON MACRANTHUM, *Nutt.; Gray, Pl. Fendl. p.* 67, *etc.* Cobre, New Mexico; *Wright, Bigelow.*

ERIGERON DIVERGENS, *Torr. & Gray, Fl.* 2, *p.* 175; *Gray, Pl. Wright,* 2, *p.* 77; var. CINEREUM. W. Texas to the Gila (*Thurber*) and Tucson, Sonora; *Schott.*

ERIGERON BELLIDIASTRUM, *Nutt.; Gray, l. c.* New Mexico; *Wright.*

ERIGERON (CŒNOTUS) SUBDECURRENS? Conyza subdecurrens, *Gray, Pl. Fendl. p.* 78, *& Pl. Wrigh,* 1, *p.* 172. W. Texas (on the Pecos) to the Gila and Sonora; *Thurber.* San Luis Rey, California; *Parry.* It is very doubtful if this be De Candolle's plant, of which I found no specimens in the *reliquiæ* of Berlandier's collection.

ERIGERON GLAUCUM, *Ker.; Torr. & Gray, Fl. l. c.* Monterey, California; *Parry, etc.*

ERIGERON DOUGLASII, *Torr. & Gray, l. c.;* var. foliis angustissimis fere filiformibus. Mountains near San Diego, California; *Parry, Thurber, Schott.*

ERIGERON (POLYACTIDIUM) DELPHINIFOLIUM, *Willd.; Gray, Pl. Wright, l. c.* Cobre, New Mexico, &c.; *Wright, Bigelow, Thurber,* (a canescently hirsute variety.)

ERIGERON MODESTUM, *Gray, l. c.* Live Oak creek, Texas; *Wright.*

ERIGERON BIGELOVII (sp. nov.): cinero-hispidum; caulibus (6–8-pollicaribus) e basi lignescente ramosis adscendentibus, ramulis monocephalis; foliis linearibus spathulato-lanceolatis acutatis, inferioribus spathulatis integerrimis in petiolum attenuatis; involucro subtriseriali, squamis lineari-lanceolatis acuminatis margine scariosis dorso subglandulosis parcissime hispidis, exterioribus brevioribus; ligulis 40–50 uniserialibus purpureis; acheniis hispidis; pappo e setis hispidulis 15–16 corollam disci subæquantibus et totidem squamellato-setaceis subtriplo brevioribus. Near Fronteras, New Mexico, March, April; *Bigelow.* Also collected by Mr. Wright, but in too few specimens for distribution. The species should rank next to E. modestum; but its heads are nearly twice as large; the rays (3 lines long) purple, more imbricated; the involucre scarcely hispid, and the pappus less fragile; the exterior series longer. It is one of the species intermediate between Erigeron (Pseuderigeron) and Diplopappus.

DIPLOPAPPUS ERICOIDES, *Torr. & Gray, Fl.* 2, *p.* 182; var. HIRTELLA, *Gray, Pl. Fendl. p.* 69. Rocky places throughout New Mexico and adjacent districts.

DISTASIS MODESTA, *DC. Prodr.* 5, *p.* 279. High plateaus on the Rio Grande, Pecos, etc. On Mt. Carmel Dr. *Parry* gathered a glabrate autumnal form, with longer and rigid branches, which is somewhat peculiar.

TOWNSENDIA STRIGOSA, *Nutt.; Torr. & Gray, Fl. l. c.* El Paso, and adjacent parts of Chihuahua.

TOWNSENDIA (MEGALASTRUM) WRIGHTII: suffrutescens, viscoso-puberula; ramis adscendentibus (subpedalibus) apice nudis; foliis spathulatis integerrimis setigero-apiculatis inferne in petiolum marginatum attenuatis; involucri biserialis squamis ovato-lanceolatis longe caudato-acuminatis submarginatis extus glanduloso-puberulis; ligulis magnis; pappo in radio et disco conformi multisetoso.—Aster? (Megalastrum) Wrightii, *Gray, Pl. Wright,* 2, *p.* 75. Stony hills on the Rio Grande, 60 or 70 miles below El Paso; *Wright.* Mouth of the great cañon of the Rio Grande; *Bigelow.* This striking plant is clearly only an extreme form of Townsendia, with the pappus more copious and finer than usual.

EREMIASTRUM BELLIOIDES, *Torr. & Gray, Pl. Thurber, p.* 320; *& in Pacif. R. Road Expl.* 6, *p.* 361, *t.* 6. On the desert of the Colorado of the West; *Thurber.* Fort Yuma, etc.; *Schott.* The specimens all too young.

KEERLIA BELLIDIFOLIA, *Gray & Engelm. Pl. Lindh.* 2, *p.* 220. On the Nueces and Blanco; *Wright, Parry.*

APHANOSTEPHUS RAMOSISSIMUS, *DC.; Gray, Pl. Wright, l. c.* On the Nueces, Rio Grande, etc.

This varies greatly in foliage, etc. The following are some of the numbers under which it is distributed in Berlandier's collection: 2061, 1787, 1074, 2504, 3168, 1888, 1077, 2507.

BELLIS INTEGRIFOLIA, *Michx.* Low places on the Pecos, Limpio, etc.; *Bigelow, Wright.* The minute hairs on the achenium are glochidiate.

GYMNOSPERMA CORYMBOSUM, *DC. Prodr.* 5, *p.* 312. Along the Rio Grande. All three of De Candolle's Mexican species must be reduced to one.

GUTIERRERIA WRIGHTII, *Gray, Pl. Wright,* 2, *p.* 78. Between Babocomori and Santa Cruz, Sonora; *Wright.* Cobre; New Mexico, *Bigelow.*

GUTIERREZIA GYMNOSPERMOIDES, *Gray, l. c.* Low banks of the San Pedro, Sonora; *Wright.* Santa Maria, Chihuahua, *Thurber.*—Lower leaves often pinnatifid.

GUTIERREZIA SPHÆROCEPHALA, *Gray, Pl. Fendl. p.* 73, *& Pl. Wright, l. c.* From Indianola, Texas, to Cobre, New Mexico, and Chihuahua.

GUTIERREZIA ERIOCARPA, *Gray, Pl. Wright,* 1, *p.* 94. Along the Rio Grande. Often confounded with G. sphærocephala, and probably not really different.

GUTIERREZIA MICROCEPHALA, *Gray, l. c.* Common on the frontiers, and in Texas near the coast.

GUTIERREZIA EUTHAMIÆ, *Torr. & Gray, Fl.* 2, *p.* 123. Common in New Mexico, on the Rio Grande below El Paso, and in the northern parts of Chihuahua and Sonora. G. divaricata is only a loosely flowered variety of this, to which many of our specimens would be referred.

GUTIERREZIA TEXANA, *Torr. & Gray, l. c.* Common in the middle district of Texas.

SOLIDAGO ANGUSTA, *Torr. & Gray, l. c.* Eastern Texas; *Thurber.*

SOLIDAGO NEMORALIS, *Ait.;* var. MOLLIS. S. mollis, *Bartling; Gray, Pl. Wright,* 2, *p.* 79. S. incana, *Torr. & Gray, Fl.* 2, *p.* 221. New Mexico and western Texas, in various places; *Thurber, Bigelow, Wright, Parry.* The plant runs into S. nemoralis, and must be appended to that widely distributed species.

SOLIDAGO RADULA, *Nutt.* Southern Texas; *Parry.* Includes S. rotundifolia, *DC.* and S. scaberrima, *Torr. & Gray.*

SOLIDAGO OCCIDENTALIS, *Nutt. in Torr. & Gray, l. c.* Common on the banks of the Mimbres, New Mexico; *Wright, Bigelow.* San Luis Rey, California; *Parry.*

SOLIDAGO PETIOLARIS, *Ait.; Torr. & Gray, l. c.* Cobre, New Mexico, etc.

SOLIDAGO ELONGATA, *Nutt.; Torr. & Gray, l. c.* California; *Schott.* New Mexico; *Bigelow.*

SOLIDAGO CALIFORNICA, *Nutt.; Torr. & Gray, l. c.* Mountains east of San Diego; *Parry,* etc. Mr. Thurber gathered a Solidago, which may be a variety of this, in Chihuahua.

SOLIDAGO CANADENSIS, *Linn.* var. PROCERA, *Torr. & Gray, Fl.* Cobre, etc., New Mexico; *Bigelow.*

LINOSYRIS ARBORESCENS, (sp. nov.): glabra, viscidula; caule 10-pedali lignosa; ramis apice corymboso–polycephalis; foliis anguste linearibus acutis, ramulorum subulatis; involucro pauciseriali disco breviore 20–25-floro, squamis lanceolatis acutis carinatis margine scarioso-ciliolatis; appendicibus styli lanceolato-subulatis portionem stigmatiferum æquantibus; acheniis brevibus turgidis pubescentibus.—California; *Rev. Mr. Fitch.* The flowering branchlets in Mr. Fitch's collection are stated to belong to "a tree 10 feet high." They are slender and very leafy; the leaves are one or two inches in length, about a line wide, much like those of L. vulgaris, only a little viscid. Corymb crowded. Heads three lines long; the flowers all tubular, but occasionally a marginal one shows a tendency to become irregular, and to have its anthers abortive. Receptacle alveolate and toothed. Achenia all fertile, short-oblong, turgid, not compressed. This is surely a congener of L. vulgaris, and no less so, perhaps, of Ericameria resinosa, *Nutt.*, the ligules of which are often imperfect. In two directions, species which I cannot separate from Linosyris make too close an approach to Aplopappus.—(*Vide Pl. Wright*, 1, p. 96, & 2, p. 81.)

LINOSYRIS (CHRYSOTHAMNUS) VISCIDIFLORA, *Torr. & Gray;* var. PANICULATA. California; *Schott.* The locality not recorded. This, with a Californian specimen gathered on the Sacramento in Wilkes' Exploring Expedition, perhaps belongs to an undescribed species; but the distinctions between it and L. viscidiflora, (a bad name,) on the one hand, and Ericameria resinosa, *Nutt.*, on the other, are not clear. Better specimens of these plants are needed for illustration.

LINOSYRIS GRAVEOLENS, *Torr. & Gray, l. c.* Cobre, New Mexico; *Bigelow.* Sierra de los Animos; *Wright.*

LINOSYRIS PULCHELLA, *Gray, Pl. Wright*, 1, *p.* 96, *&* 2, *p.* 80. Sandy banks of the Rio Grande, New Mexico; *Wright, Bigelow.* Sand hills, Chihuahua; October; *Thurber.*

LINOSYRIS WRIGHTII, *Gray, Pl. Wright*, 1, *p.* 95, *&* 2, *p.* 80. Along the Rio Grande, New Mexico, etc.; *Wright, Bigelow.* As already remarked, some forms appear to connect L. hirtella with this species.

LINOSYRIS CORONOPIFOLIA, *Gray, Pl. Wright*, 1, *p.* 96. Lower Rio Grande to Eagle Pass, Los Moros, etc.; *Schott, Parry, Bigelow.*

LINOSYRIS? CARNOSA, *Gray, Pl. Wright*, 2, *p.* 80. Subsaline soil west of the Chiricahui mountains; *Wright.* Gathered by Mr. Wright; the affinities of the plant still doubtful.

LINOSYRIS (APLODISCUS) DRUMMONDII, *Torr. & Gray, Fl.* 2, *p.* 233. Prairies between Indianola and San Antonio, Texas; *Parry.* On the lower Rio Grande; *Schott.*

LINOSYRIS (APLODISCUS) MEXICANA, *Schleccht. Hort. Hal. p.* 7, *t.* 4. Aplopappus (Aplodiscus) discoideus, *DC.* Lower Rio Grande? *Schott*, who also gathered a var. TOMENTOSA: pube laxa decidua lanata. The particular locality not recorded.

LINOSYRIS (APLODISCUS) MENZIESII, *Gray, Pl. Wright*, 1, *p.* 97. Aplopappus Menziesii, *Torr. & Gray.* San Luis Rey, San Diego, Carisso creek, &c.; *Parry, Schott*, &c. Common in dry places, growing in bunches. Dr. Hulse gathered in the valley of the Sacramento a scabrous variety of this, with the lower leaves large and obovate.

APLOPAPPUS (ERICAMERIA) ERICOIDES, *Hook. & Arn. Bot. Beech, p.* 146. California; *Schott.*

APLOPAPPUS (ERICAMERIA) LARICIFOLIUS, *Gray, Pl. Wright*, 2, *p.* 80. Guadalupe Pass, New Mexico; *Wright.* Organ mountains; *Bigelow.*

APLOPAPPUS PHYLLOCEPHALUS, *DC. Prodr.* 5, *p.* 347. A. rubiginosus, *Torr. & Gray, l. c.* Lower Rio Grande; *Schott.* The species was founded on Berlandier's No. 2278, which is a state of the species named A. rubiginosus in the Flora of North America, but just beginning to blossom, and with nearly sessile heads.

APLOPAPPUS SPINULOSUS, *DC. l. c.* Everywhere common along streams, from Texas to Sonora.

APLOPAPPUS GRACILIS, *Gray, Pl. Fendl. p.* 76. Common through New Mexico and Sonora in sandy places.

APLOPAPPUS (PRIONOPSIS) CILIATUS, *DC. Prodr.* 5, *p.* 346. Plains and alluvial banks of rivers, western and southern Texas; *Bigelow, Schott.*

XANTHISMA TEXANUM, *DC. Prodr.* 5, *p.* 94; var. BERLANDIERI, *Gray, Pl. Wright*, 1, *p.* 98. On the lower Rio Grande; *Schott.* This is the form, with very obtuse involucral scales, on which the genus was founded, viz: Berlandier's No. 2039, misprinted 2639, gathered near

Medina. Some of the specimens afterwards collected by Berlandier (distributed as Nos. 2562 and 2573) connect this with the variety Drummondii, (Centauridium Drummondii, *Torr. & Gray*,) which has acute or cuspidate involucral scales.

GRINDELIA SQUARROSA, *Dunal.;* var. GRANDIFLORA, *Gray, Pl. Wright*, 1, *p.* 98, etc. On the Manzanal, Texas, etc. It is No. 1921 of Berlandier's collection.

GRINDELIA LANCEOLATA, *Nutt.; Torr. & Gray, l. c.* Cobre, New Mexico; *Thurber, Bigelow.* Probably a mere variety of G. squarrosa.

GRINDELIA ARGUTA, *Schrader, in DC. l. c.* Cobre cañon; *Wright, Thurber.* Probably this is likewise G. squarrosa.

GRINDELIA INULOIDES, *Willd.;* var. MICROCEPHALA. G. microcephala, *DC. Prodr.* Southern and western Texas; *Schott, Parry.* This is the same as Berlandier's plant, (No. 2057,) on which De Candolle founded his G. microcephala. The achenia are of the same shape as in G. inuloides; but their thick walls are generally smooth and even, yet some of them show traces of the corky-rugose character of those of genuine G. inuloides.

PENTACHAETA AUREA, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p.* 336; *Torr. & Gray, Fl.* 2, *p.* 249. Var. β. capitulis majoribus multiradiatis.—San Luis Rey; February. Var. γ. capitulis multo minoribus; involucri squamis plerumque obtusis; ligulis 7–10.—Cordilleras, near San Felipe, California, on the eastern slope; June. The first variety is a strong vernal form, with larger heads than in my specimens from Nuttall, yet agreeing very well with his description. The second is a later, much branched state, I believe, of the same species, although the heads are only one-third as large, the rays and the involucral scales proportionally fewer, and the latter either obtuse or retuse, or merely mucronate. The pappus of this occasionally consists of 6 or 8 bristles. The comparison of both forms with Nuttall's original specimens shows that they all belong to one species.

BRADBURIA HIRTELLA, *Torr. & Gray, Fl.* 2, *p.* 250. Eagle Pass, etc., on the Rio Grande, Texas; *Schott.*

HETEROTHECA SCABRA, *DC.; Torr. & Gray, l. c.* San Antonio to Presidio del Norte, etc.; *Bigelow, Schott, Parry.* Very tall specimens were gathered at Presidio by Dr. Bigelow, growing four feet high.

HETEROTHECA FLORIBUNDA, *Benth. Bot. Voy. Sulph. p.* 24. San Luis Rey, California; October; *Parry.* This is certainly Bentham's H. floribunda, and is the same as No. 275 of Coulter's California collection, although the heads are somewhat larger. I fear it passes into H. grandiflora, *Nutt.*

CHRYSOPSIS CANESCENS, *Torr. & Gray, Fl.* 2, *p.* 256. On the Cibolo, Salado, and Limpio, Texas; *Bigelow, Schott.*

CHRYSOPSIS VILLOSA, *Nutt.* San Estaban, New Mexico; *Bigelow.*

CHRYSOPSIS FOLIOSA, *Nutt.* New Mexico, northern Sonora, etc. This and C. hispida vary greatly in appearance, and are probably to be reduced to C. villosa.

CHRYSOPSIS HISPIDA, *Hook.* Clefts of rocks between the San Pedro and Pecos; *Bigelow.*

CHRYSOPSIS PILOSA, *Nutt.* On the Rio Grande near Coleto creek; *Schott.*

LAPHAMIA HALIMIFOLIA, *Gray, Pl. Wright*, 1, *p.* 100, *t.* 9. Hills of the San Pedro; *Wright, Bigelow.*

LAPHAMIA ANGUSTIFOLIA, *Gray, l. c.* High rocky hills of the Pecos, in crevices of the limestone, and mountains near Live Oak creek; *Bigelow, Wright.* Also between San Pedro and the Puercos; *Schott.*

LAPHAMIA ANGUSTIFOLIA? var. LACINIATA: caulibus elongatis diffusis; foliis oblongis subcuneatis laciniato-lobatis.—Crevices of rocks along the Rio Grande, Texas; October; *Bigelow*, *Schott*. This is doubtless an autumnal state either of L. angustifolia or of L. halimifolia, with weak stems prolonged to the length of a foot. From the foliage it might as well be judged to be a state of the latter, but the rayless heads and flowers are those of the former. It seems to indicate that the two species may not really be distinct.

LAPHAMIA BISETOSA, *Torr. in Pl. Wright*, 2, *p.* 106. Limestone rocks below Mount Carmel, on the Rio Grande; October; *Parry*. Heads as large as in L. rupestris.

LAPHAMIA DISSECTA, *Torr. in Pl. Wright*, 2, *p.* 81. Crevices of limestone, cañon of San Carlos, and near Presidio del Norte, on the Rio Grande; *Parry*, *Bigelow*.

LAPHAMIA (PAPPOTHRIX) RUPESTRIS, *Gray*, *Pl. Wright*, 1, *p.* 99, *t.* 9. Crevices in basaltic rocks on the Limpio; also San Estaban, Florence mountains, Escondido creek, etc.; *Wright*, *Bigelow*, *Parry*.

LAPHAMIA (PAPPOTHRIX) CINEREA (sp. nov.): nana, lanoso-tomentulosa; caulibus subdiffusis usque ad apicem foliosis; foliis oppositis rotundis subintegerrimis parvis, adultis subglabratis; pedunculis folia paullo superantibus; acheniis sæpius 3–4-nervatis; pappo rigidio tubo corollæ vix longiore.—On rocks near Escondido creek; September; *Bigelow*. This differs from the last, possibly not specifically, in its somewhat floccose woolly pubescence, which renders all the young parts canescent, its entire or very obscurely toothed leaves, its rather longer peduncles, the longer proper tube to the corolla, its proportionally shorter pappus of stouter and more rigid bristles; and some of the achenia have four salient and unequally disposed ribs or nerves, but the greater number three, of which two are usually approximate at one margin. The leaves are from three to six lines in diameter, orbicular or broadly ovate, sometimes obscurely cordate, entire, or obsoletely repand-toothed.

PERITYLE CORONOPIFOLIA, *Gray*, *Pl. Wright*, 2, *p.* 82. Cobre, New Mexico; *Bigelow*, *Wright*. Arroyo de los Nogales, Sonora; *Schott*.

PERITYLE PARRYI, *Gray*, *Pl. Wright*, 2, *p.* 106. In a cañon of the Rio Grande below Mount Carmel; *Parry*.

PERITYLE AGLOSSA, *Gray*, *l. c.* With the preceding; *Parry*. This is an annual, not suffrutescent at the base, as stated in the published description; and the larger leaves are often two inches wide.

PERITYLE NUDA, *Torr. Mss.; Gray in Torr. Bot. Whippl. Rep. p.* 100. On the Gila, near the Pimo village; *Parry*. The rays are plainly yellow.

PERITYLE EMORYI, (*Torr. in Emory*, *Rep. N. Mex.* 1848, *p.* 142): ligulis ovalibus; pappo uniaristato, arista setiformi corolla breviore inferne nuda vel scabra, versus apicem parce retrorsum vel patentissime barbellata-hispida.—On the desert of the Colorado of the West; *Emory*, *Schott*, etc. Fort Yuma; *Major Thomas*. This plant so closely resembles P. nuda in foliage, (although the leaves are not always so much cut,) pubescence, in the size of the heads and broad scales of the involucre, in every respect, indeed, except in the awn to the pappus, (the squamellae of which are, perhaps, less united,) that it is far most probable the two are forms of one species. In this case the name of P. Emoryi, which was indicated and published in 1848, would, on all accounts, take precedence, and P. nuda be held as a variety of it. P. plumigera is distinguished by the smaller heads, narrower involucral scales, and longer upwardly barbellate awn of the pappus.

PERICOME CAUDATA, *Gray, Pl. Wright,* 2, *p.* 81. Cobre, New Mexico; *Wright, Bigelow.* Hot Springs, east of the Mimbres; *Bigelow.*

BACCHARIS CŒRULESCENS, *DC. Prodr.* 5, *p.* 402. From the lower Rio Grande to the Mimbres, and the Colorado of the West.

BACCHARIS CŒRULESCENS, *DC. Prodr.* 5, *p.* 402. var. foliis angustioribus. B. Pingræa, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p.* 337, non *DC.* San Luis Rey, California; *Parry.* The specimen accords with No. 305 of Wright's N. Mexican collection, and is, I doubt not, merely a narrow form of B. cœrulescens, *DC.* But it is Nuttall's B. Pingræa, which is wrongly adduced as a synonym of B. Douglasii in *Torr & Gray, Fl. N. Am.* 2, *p.* 259, the real B. Douglasii (= No. 1776 Pl. Hartw.) not being then known to the authors.

BACCHARIS CONSANGUINEA, *DC. Prodr.* 5, *p.* 408. San Diego? California; *Schott.*

BACCHARIS PILULARIS, *DC. l. c.* San Luis Rey, California; *Parry.*

BACCHARIS SALICINA, *Torr. & Gray, Fl.* On the Rio Grande and Mimbres; *Wright, Bigelow,* etc.

BACCHARIS ANGUSTIFOLIA, *Michx?; Gray, Pl. Lindh.* 2, *p.* 224. Fort Inge, Texas, to the San Pedro valley, Sonora, etc.; *Schott, Bigelow.*

BACCHARIS EMORYI (sp. nov.): suffruticosa, glabra, paniculato-ramosissima; ramulis angulato-striatis; foliis subspathulato-linearibus obtusis uninerviis integerrimis (subpollicaribus) deciduis vel raris, ramulinis minimis; capitulis solitaris geminisve in ramulos breves vel pedunculos paniculatos; involucro fœmineo obovato majusculo multiseriali pappo dimidio breviore; squamis glabris appressis coriaceis obtusis, exterioribus ovatis, intimis linearibus; acheniis glaberrimis.—Very common on the Gila; *Emory,* coll. in 1846, etc. Fort Yuma, E. California; *Major Thomas.* Sterile plant not seen. Involucre of fertile flowers 3 or 4 lines long; the thick scales closely appressed, and all the outer ones very obtuse, their very slight scarious margin not ciliate. Pappus half an inch long, whitish.

BACCHARIS SERGILOIDES (sp. nov.): suffruticosa, glabra, confertim ramosissima; ramis ramulisque angulatis rigidis articulatis sæpissime aphyllis; foliis dum adsunt raris parvis spathulatis uninerviis, ramulorum ad bracteas minimas reductis; capitulis parvis in ramulos confertis subsessilibus, masculis magis glomeratis; involucro obovato, squamis multiseriatis appressis glabris oblongis, vel interioribus lanceolatis; fœm. acutis; masc. omnino obtusis; receptaculo conico subpaleaceo; acheniis glabris; pappo brevi.—Along the Gila or Colorado; *Emory,* 1846. Dry arroyos, 50 miles west of the Colorado; *Bigelow.* Southern part of California; *Dr. J. Le Conte.* Apparently two or three feet high, and very bushy and broomlike; the numerous heads only two, or, at most, three lines in diameter.

BACCHARIS BRACHYPHYLLA, *Gray, Pl. Wright,* 2, *p.* 83. Southern borders of New Mexico; *Wright.*

BACCHARIS WRIGHTII, *Gray, Pl. Wright,* 1, *p.* 101. Western Texas to Chihuahua; common.

BACCHARIS PTARMICÆFOLIA, *DC. Prodr.* 5, *p.* 419; *Schultz, in Bot. Herald, p.* 303. Hill sides between Babocomori and Santa Cruz, Sonora; *Wright* (1201). This is the same as Seemann's plant from the Sierra Madre, and, except in the smaller leaves and heads, accords very well with a specimen from the valley of Mexico, collected by Schaffner, and named B. ptarmicæfolia by Dr. Schultz. It accords still better, perhaps, with the character of B. thesioides, to which De Candolle's species and all these specimens are probably to be referred.

Baccharis Bigelovii (sp. nov.): herbacea, glabra; ramulis striato-angulatis; foliis subviscosis oblongis lanceolatisve basi in petiolum angustatis grosse argute serratis, majoribus subincisis vel duplicato-serratis uninerviis obsolete venosis; capitulis masculis et fœmineis laxe paniculato-corymbosis parvis (lineas 2 longis) breviter pedicellatis 15–18-floris; involucri squamis 3–4-seriatis oblongo-lanceolatis sub-acutis margine scarioso eroso superne ciliatis; pappi setis fl. masc. subclavellatis.—B. ptarmicæfolia? *Gray, Pl. Wright*, 2, *p*. 83. Mountain ravine, Santa Cruz, Sonora; *Wright* (1200, male). Puerto de Paysano; *Bigelow* (both sexes). Oak woods between Babocomori and Santa Cruz; *Thurber*. The additional specimens, of both sexes, show this to be clearly different from the preceding, and probably an unpublished species. The leaves in Dr. Bigelow's specimens, from which the character is principally taken, are much broader than in Wright's or Thurber's, more irregularly toothed or incised, and all obtuse, while those of Wright's are lanceolate or linear-lanceolate, and often acute.

Baccharis ramulosa, *Gray, Pl. Thurb. p.* 301. Aplopappus (Aplodiscus) ramulosa, *DC. Prodr*. 5, *p*. 350. Linosyris (Aplodiscus) ramulosa, *Gray, Pl. Wright*, 1, *p*. 97, *&* 2, *p*. 80. Organ mountains, Cobre, etc., New Mexico; *Wright, Bigelow*. Guadalupe cañon; *Parry*. Mr. Wright and Dr. Gregg collected only the male plant, apparently the same with that published by De Candolle from Keerl's Mexican collection. The fertile plant now being known, the plant is found to be a genuine Baccharis. Berlandier likewise collected specimens in the mountains of San Luis Potosi (No. 1352.)

Tessaria (Phalacrocline) borealis, *Gray, Pl. Fendl. p.* 75, *& Pl. Wright, l. c.* River bottoms from the Rio Grande, New Mexico, to the Colorado of the West; gathered by all the collectors. Shrubby, 4–8 feet high, called *Arrow-wood;* forming dense thickets.

Pluchea camphorata, *DC.; Torr. & Gray, Fl.* 2, *p*. 261. San Luis Rey, California; *Parry*. Heads rather larger and the pedicels more downy; otherwise just as in the eastern plant.

Pluchea fœtida, *DC.; Torr. & Gray, l. c.* Low places on the San Pedro, Texas; *Bigelow*.

Filaginopsis multicaulis, *Torr. & Gray, Fl.* 2, *p*. 263, *& in Pope R. R. Survey, t*. 3. Eastern Texas to El Paso and Chihuahua. Evidently F. Drummondii, *Torr. & Gray*, is not a distinct species. It is distributed among Berlandier's *reliquiæ*, under the Nos. 568, 1011, 1067, 1958, 2109, 2241, 2497.

Diaperia prolifera, *Nutt.; Torr. & Gray, l. c.* Stony hills of the Pecos and Blanco; Texas; *Wright*.

Evax (Hesperevax) caulescens, *Gray, in Bot. Whipp. Rep. p.* 101, *t*. 11. Psilocarphus caulescens, *Benth. Pl. Hartw. p*. 319. Sacramento valley, California; *Mr. Fitch*.

Psilocarphus tenellus, *Nutt.; Torr. & Gray, l. c., & in Whipp. Rep. l. c.* With the last; *Mr. Fitch*.

Stylocline micropoides, *Gray, Pl. Wright*, 2, *p*. 84. Fronteras, New Mexico; *Wright, Parry*.

Eclipta erecta, *Linn*.; var. brachypoda, *Torr. & Gray*. San Antonio, San Pedro, and the lower Rio Grande, Texas; *Schott*, etc.

Borrichia frutescens, *DC*. Texas, on the Pecos; *Wright*. Galveston and the lower Rio Grande; *Schott*.

Silphium scaberrimum, *Ell.; Torr. & Gray, Fl*. 2, *p*. 279. On the Sabinal, Texas; *Wright*.

BERLANDIERA TEXANA, *DC. Prodr.* 5, *p.* 516; *Deless. Ic. Sel.* 4, *t.* 26. Coleto creek and the Rio Grande, Texas; *Schott.*

BERLANDIERA LYRATA, *Benth. Pl. Hartw. p.* 17. Cobre, Mimbres, Mule creek, etc , New Mexico; *Bigelow*, *Wright.* On the Rio Grande and in the Sierra Madre, Sonora; *Schott*, etc.

ENGELMANNIA PINNATIFIDA, *Torr. & Gray. l. c.* Rock creek, Texas; *Bigelow.* On the Rio Grande, at Cleto creek; *Schott.* A marked variety of this, with single and larger heads, smaller pappus, and less lobed leaves, was gathered by Thurber at Ojo Caliente, Chihuahua.

MELAMPODIUM CINEREUM, *DC.; Gray, Pl. Wright*, 1, *p.* 103, *&* 2, *p.* 85, & var. RAMOSISSIMUM (M. ramosissimum, *DC.*) Common in Texas and New Mexico. Very various forms occur in Berlandier's collection, under Nos. 833, 2242, from San Fernando, Coahuila; 1492, 1881, from Bexar; and 607, 2017, from Laredo and the Nueces.

MELAMPODIUM HISPIDUM, *H. B. K.; Gray, Pl. Wright*, 2, *p.* 85. Between the San Pedro and Santa Cruz, Sonora; *Wright.* Accords well with Mexican specimens collected by Schaffner.

MELAMPODIUM LONGICORNU, (*Gray, Pl. Thurber, p.* 321): annuum, hispidulum, diffuse ramosum; foliis lanceolatis subintegerrimis; pedunculis alaribus filiformibus ($\frac{2}{3}$–2 unc. longis) monocephalis; involucri squamis internis fructiferis 7–10 nervoso-striatis dorso vix muricatis apice in cornu longissimum extus sericeo-puberulum circinnatum productis; ligulis aureis oblongis.—Near Santa Cruz, Sonora; *Thurber.* Santa Magdalena, Sonora; *Schott.* The published character of this curious species is here somewhat amended, since Mr. Schott's specimens (which are in good flower, while those of Mr. Thurber were in fruit) show conspicuous rays much longer than the disk; but they have the same long and silky horns. The leaves are not always perfectly entire, nor all obtuse.

DICRANOCARPUS, *Nov. Gen.*

Capitulum pauciflorum; floribus exterioribus 3–4 fœmineis subradiatis, ligula minima 2–3-loba, stylo breviore; disci totidem sterilibus, tubo corollæ cylindrico, limbo cyathiformi 5-fido. Involucrum 1–2-bracteolatum (bracteolis linearibus parvis), 3–4-phyllum: squamæ oblongæ, obtusæ, membranaceæ, erectæ, subplanæ, demum deciduæ. Receptaculum planum: paleæ lineares parvæ inter flores. Antheræ oblongæ, ecaudatæ. Stylus fl. masc. inclusus, indivisus, apice clavato-pubescens; fl. fœm. bifidus, ramis inappendiculatis. Ovaria disci inania, epapposa. Achenia (radii) difformis, nempe 1–2 linearia vel subulata, subteretia, lævia, persistentia, aristis 2 validis lævissimis divergentibus seu recurvis persistentibus cornuta; cætera breviora et crassiora, intus sæpe tuberculato-rugosa, aristis brevioribus vel obsoletis.—Herba annua, gracilis, fere glabra, *Heterospermi* facie, microcephala; foliis oppositis 3–5-sectis, summisve integris, filiformibus; capitulis solitariis pedunculatis; floribus flavis.

DICRANOCARPUS PARVIFLORUS, *Gray, Pl. Thurber, p.* 322, *adn.* Heterospermum dicranocarpum, *Gray, Pl. Wright,* 1, *p.* 109. Plains below San Carlos, Tamaulipas; *Parry.* Only mature achenia of this plant were known, from Wright's first collection, persisting on the receptacle from which everything else had fallen. The flowers, etc., furnished by Dr. Parry, enable us to complete the characters; these show that the plant is by no means a Heterospermum, (although allied to that genus,) but a new generic type which, according to the classification adopted, must be referred to the rather incongruous subtribe Melampodineæ. The flowering heads are only a line and a half in length, and the scarcely explanate ray-corollas are smaller than those of the disk. The fertile ovaries, at least the one or two which make the longer and subulate achenia, begin to elongate soon after anthesis, and to project to twice or thrice the length of the involucre. The scales of the latter subtend the fertile flowers, but do not inclose or embrace them. Paleæ of the receptacle much smaller than the involucral scales, linear, plane, forming a circle between the ray and the disk, one subtending each sterile flower. Sterile style barely bidentate at the apiculate tip. The longer achenia, which usually persist after the fall of the involucre, etc., are from 3 to 4½ lines long, (excluding the awns,) barely half a line in thickness, slightly obcompressed, even, not at all margined, tipped with two stout, diverging or sometimes recurved-spreading, smooth, rigid, inarticulated and persistent, subulate awns, of 1½ to 3 lines in length. There is usually only one such achenium to each capitulum. The others are shorter and thicker, and tuberculate-rugose inside, but otherwise similar, or one of them barely 2 lines long, oblong, truncate at both ends, the apex bearing two very short and divaricate or almost obsolete awns or horns.

PARTHENIUM INCANUM, *H. B. K.; Gray, Pl. Wright*, 1, *p*. 103, *&* 2, *p*. 85. P. ramosissimum, *DC. Prodr.* 5, *p*. 532. From the Pecos to Cobre, etc.; *Bigelow, Wright, Schott.* On the Rio Grande, below Mount Carmel; *Parry.*

PARTHENIUM ARGENTATUM (sp. nov.): fruticosum, pube brevi appressima sericeo-incanum; foliis spathulato-lanceolatis oblongisve in petiolum longe attenuatis parce dentatis seu laciniatis sub-triplinerviis; ramulis floridis elongatis nudis oligocephalis; involucri squamis obtusissimis; acheniis sericeis; pappo e paleis 2 membranaceis lanceolatis.—Near Escondido Creek, Texas, in rocky places, Sept. 1852; *Dr. Bigelow.*—A well marked species, connecting the sections Argyrochæta and Parthenichæta; the leaves and branches whitened with a very fine and close silky-silvery pubescence, which appears to be wholly or nearly persistent. Leaves one to two inches long, including the tapering base and petiole, 2 to 5 lines wide, mostly acute, scarcely veined, beset on each margin with from one to three salient teeth, or sharp lobes. Flowering branchlets slender, 4 to 8 inches long, nearly leafless and peduncle-like, bearing 3 to 7 sub-sessile heads (as large as those of P. incanum) in a cluster. Exterior scales of the involucre short, orbicular-ovate; the inner orbicular, scarious-membranaceous. Paleæ of the pappus lanceolate or oblong-lanceolate, rather narrower and less obtuse than in P. Hysterophorus, puberulent, the inner edge more or less adnate to the base of the broadly obovate and cucullate emarginate ligule.

PARTHENIUM HYSTEROPHORUS, *Linn.* Texas, etc.; common in low places.

PARTHENICE MOLLIS, *Gray, Pl. Wright*, 2, *p*. 85. Near Santa Cruz, Sonora; *Wright, Thurber.*

EUPHROSYNE AMBROSIÆFOLIA, *Gray, Pl. Wright*, 1, *p*. 102, *&* 2, *p*. 85. Near Conde's Camp, New Mexico; *Wright.* Cook's Springs; *Bigelow.*

IVA DEALBATA, *Gray, Pl. Wright*, 1, *p*. 104. Leon Springs; *Bigelow.* Lagunas de Patos, Chihuahua; *Thurber.*

DICORIA, *Torr. & Gray, in Emory, Rep.*, 1848, *p*. 143.

Capitulum monoicum; floribus fœmineis 2 in ambitu, masculis 8-12 in disco. Involucrum patulum, duplex, exterius e phyllis 5 ovalibus herbaceis uniseriatis, interius e squamis 2 orbiculatis tenuiter scariosis planis mox accrescentibus, utraque florem fœmineum fulcrante. Receptaculum parvum, planum, paleis angustis lineari-spathulatis inter flores. *Fl. Foem.* Corolla nulla; stylus alte bifidus, ramis linearibus glabris. *Fl. masc.* Corolla obconica, 5-dentata. Antheræ vix coalitæ, sed filamentis monadelphis. Stylus abortivus in synemate apice 5-dentato inclusus, simplicissimus. Ovarium nullum. Achenia obcompresso-plana, ala laciniata circumdata, cum squamis fructiferis petaloideo-scariosis iis majoribus involucrum externum multoties superantia. Pappus brevis, plurisetulosus, deciduus vel evanescens.—Herba humilis, ramosa, hispidulo-canescens, alternifolia; capitulis racemoso-paniculatis, fructiferis cernuis.

D. CANESCENS. In the sandy desert of the Gila and of the Colorado; *Emory*. A small specimen of this curious plant was brought home by Col. Emory from his reconnaissance of the Gila, etc., in 1846; but it has not again been met with. The base of the plant is unknown. Leaves, at least the upper ones, alternate, oval, obtusely dentate, on slender petioles, scabrous or hispid, and when young canescently villous on both sides; those of the flowering branches gradually reduced to small and spatulate bracts. Heads short-pedicelled, arranged in loose and nearly leafless spikes or racemes, which are panicled at the summit of the stem in anthesis, only one and a half lines long; but in fruit the whitish and somewhat glandular and erose pair of inner involucral scales become three or four lines long and almost as broad; they are loosely appressed to the achenia which they subtend, and appear to be deciduous with them at maturity. The mature achenia are about 3 lines long, and 2 lines wide, including the strong laciniate-toothed and incised wing, both faces slightly hispid, and carinately one-nerved in the middle; near the summit of the nerve of the inner, and sometimes of the outer face also, a small crest often appears like the rudiments of an anterior and posterior wing. Although the full-grown achenia commonly appear destitute of a pappus, yet in the flowering state there is always a rather conspicuous ring of short bristles surrounding the base of the naked style, and traces of it are generally discernible at maturity. The bristles are united at the base into a ring, and appear to form a true pappus. They consist, however, of single rows of cells, exactly like the short and fine bristly hairs which fringe the margin of the inner involucral scales. It will be seen that the genus belongs to the division Iveæ of De Candolle. The name (from *δισ*, two, and *κορισ*, a bug,) alludes to the two achenia appearing like bugs, or like the achenia of some species of Coreopsis.

AMBROISA PSILOSTACHYA, *DC. Prodr.* 5, *p.* 526; *Gray, Pl. Wright, l. c.* A. coronopifolia, *Torr. & Gray.* Common, from Texas to Sonora. It occurs both with unarmed and tuberculate fruit.[*]

FRANSERIA TENUIFOLIA, var. TRIPINNATIFIDA, *Gray, l. c.* Common from Texas to Sonora. This is both Ambrosia fruticosa (excl. var. β) and A. confertiflora of De Candolle; but none of the forms in Berlandier's collection are at all shrubby.

FRANSERIA HOOKERIANA, *Nutt.* El Paso to Sonora, etc.; common.

FRANSERIA DUMOSA, *Gray, in Frémont*, 2d *Exped. p.* 316; var. ALBICAULIS .*F.* albicaulis, *Torr. Pl. Frém. p.* 16. Desert of the Colorado of the West; common; *Thurber, Bigelow, Schott.*

FRANSERIA DELTOIDEA, *Torr. Pl. Frémont, p.* 15. Valley of the Gila; *Parry.* A well-marked species; but it should be compared with F. chenopodifolia, *Benth. Bot. Voy. Sulph.*, from lower California.

---

[*] The following is an undescribed species, occurring in Berlandier's *reliquiæ:*

AMBROSIA CHEIRANTHIFOLIA, (sp. nov.): humilis, pube minuta canescens; ramis foliosis; foliis oblongo-lanceolatis seu oblongo-spathulatis integerrimis sessilibus, superioribus flores fœmineos fulcrantibus; capitulis masculis elongato-racemosis ebracteatis; fructibus 4–5-spinosis, spinis crassis.—San Fernando, Cohahuila, 1543, 3043.—A perennial herb, apparently not over a foot in height, considerably branched. Leaves an inch or rather more in length, 3 to 6 lines wide, all undivided and entire, whitened both sides with a fine and short appressed pubescence. Sterile heads 2½ lines long, nearly glabrous, armed with four or five short and stout spines, which are about the length of the similar beak.

HYMENOCLEA MONOGYRA, *Torr. & Gray, Pl. Fendl. p.* 79, *& Pl. Wright, l. c.* Common on the frontier, from Eagle Pass, Texas, to Sonora.

ZINNIA TENUIFLORA, *Jacq. Ic. Rar.* 3, *t.* 590; *Gray, Pl. Wright,* 2, *p.* 86. Sonora and Chihuahua; *Thurber, Schott,* etc.

ZINNIA (DIPLOTHRIX) ACEROSA, *Gray, Pl. Wright,* 1, *p.* 106. Dry hills, from Eagle Springs, etc , to El Paso; *Bigelow,* etc.

ZINNIA (DIPLOTHRIX) GRANDIFLORA, *Nutt.; Gray, Pl. Wright,* 1, *p.* 105. Sonora, Chihuahua, New Mexico, and W. Texas; gathered by all the collectors.

ZINNIA (DIPLOTHRIX) PUMILA, *Gray, Pl. Fendl. p.* 81, *& Pl. Wright, l. c.* Sonora, lower Rio Grande, etc. Intermediate forms appear to connect this with the last.

ZINNIA (HETEROGYNE) ANOMALA, *Gray, l. c. t.* 10, *f.* 2. Eagle Pass on the Rio Grande (*Bigelow*) to the San Pedro, Pecos, etc.

HELIOPSIS PARVIFOLIA, *Gray, Pl. Wright,* 2, *p.* 86. Between Babocomori and Santa Cruz, Sonora; *Wright, Thurber.* Some of Mr. Thurber's specimens have larger leaves than those of Wright.

HELIOPSIS BUPHTHALMOIDES, *Dunal,* which is also H. canescens, *H. B. K.* Between San Bernardino and Janos, Chihuahua; *Thurber.*

HALEA TEXANA, *Gray, Pl. Fendl. p.* 83, *& Pl. Wright, l. c.* Gravelly plains, western and southern Texas.

LEPACHYS COLUMNARIS, *Torr. & Gray, Fl.* 2, *p.* 215; & var. PULCHERRIMA. Western Texas to New Mexico.

LEPACHYS TAGETES, *Gray, in Bot. Whippl. Rep. p.* 103. L. columnaris, var.? Tagetes, *Gray, Pl. Wright, l. c.* Western Texas to El Paso, etc.

RUDBECKIA FULGIDA, *Ait.* Western Texas; *Bigelow.*

ALDAMA UNISERIALIS, *Gray, Pl. Lindh.* 2, *p.* 228. Southern Texas; *Schott,* etc.

HELIOMERIS MULTIFLORA, *Nutt.; Gray, Pl. Fendl. p.* 87; and var. HISPIDA, *Gray, Pl. Wright,* 2, *p.* 87. New Mexico, Sonora.

HELIOMERIS TENUIFOLIA, *Gray, l. c.* From the San Pedro, Western Texas to Sonora, Chihuahua, etc.

FLOURENSIA CERNUA, *DC. Prodr.* 5, *p.* 593. From the Pecos and Eagle Pass, on the Rio Grande, to the Mimbres, etc., "sometimes covering large tracts of ground in villages and Mesquite bottoms;" *Schott.*

ENCELIA CALIFORNICA, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p.* 357. San Diego, California; *Schott.*

ENCELIA CONSPERSA, *Benth. Bot. Voy. Sulph. p.* 26. Diluvial banks of the Colorado; February; *Schott.* This must be Bentham's E. conspersa; but the involucre is more pubescent than he describes, the rays glabrous, and the foliage retains much of the close cinereous pubescence. The heads, also, are quite small. It is probably the same as No. 308, of Coulter's Californian collection.

ENCELIA NIVEA, *Benth. l. c.* E. farinosa, *Gray, in Emory Rep. p.* 143. On the Gila; *Emory, Parry,* etc., and the Colorado of the West; *Bigelow.* This is the same as Coulter's No. 327, and must be Bentham's E. nivea, from Lower California, although the characters do not wholly accord.

Simsia (Geræa) canescens, *Gray, Pl. Fendl. p.* 85. Sand hills near Fort Yuma, California, January; *Schott.* A striking species, with a remarkably white-woolly involucre and large showy rays. A less hairy form with laciniate leaves was gathered on the Gila by *Dr. Parry.*

Simsia (Geræa, sed eradiata) frutescens, (sp. nov.): hispidulo-scaberrima, ramosissima; foliis parvis (½–¾-pollicaribus) oblongis seu ellipticis utrinque obtusis integerrimis, petiolo nudo; capitulis longiuscule pedunculatis ramulos terminantibus discoideis; involucri squamis exterioribus lanceolatis ovatisve acuminatis subsquarrosis albo-hirtis, interioribus obovatis obtusis; acheniis margine cum aristis brevibus (interdum fere obsoletis) longissime villosissimis. Agua Caliente, on the Gila; *Colonel Emory*, November 28, 1846. Sierra Prieta, near Fort Yuma, E. California, December, 1854; *Schott.* Also gathered (with rather large heads) by *Colonel Frémont,* in 1849, somewhere in the interior country of California. Fragments of this plant, too poor to characterize, have been known for some years in a small collection made by Colonel Emory in his earliest exploration of the Gila country. There are now good materials at hand. It appears that the plant must be associated with another from the same region, upon which I formerly proposed to found a genus under the name of *Geræa*, but afterwards (*Pl. Fendl. l. c.*) concluded to append to Simsia. The present species is remarkably distinguished, however, by its woody or suffruticose, slender stems, (apparently belonging to a low and much branched bushy plant,) and by the total absence of the rays, which are remarkably large in its congener. Very likely the genus Geræa (placed between Simsia and Encelia) should be re-established for these two species; but for the present they may be appended to Simsia, although new discoveries may more probably approximate them to Encelia. The heads vary from a quarter to half an inch in diameter. The awns of the pappus are often as long as the much elongated and dense fringe of soft white hairs which surround the otherwise glabrous achenium, but always covered with similar long hairs. Sometimes they are almost obsolete, or reduced to a slender base for the insertion of the tuft of hairs.

Simsia (Geræa) scaposa, *Gray, Pl. Wright. l. c.* Stony hills between the Mimbres and the Rio Grande, New Mexico; *Wright.*

Simsia exaristata, *Gray, Pl. Wright.* 2, *p.* 87. On the San Pedro, &c., Sonora; gathered by all the collectors.

Simsia (Barrattia) calva, *Gray, Pl. Lindh.* 2, *p.* 228. Throughout southern and western Texas; "common on dry and stony hill-sides of the chalk and oolite;" *Schott.*

Viguiera cordifolia, *Gray, Pl. Wright.* 1, *p.* 107, *&* 2, *p.* 89. Common in New Mexico and northern Sonora and Chihuahua; gathered by all the collectors.

Viguiera laxa, *DC.; Gray, l. c.* Cobre, &c., New Mexico; *Wright.*

Viguiera laciniata, (sp. nov.): frutescens, hispidulo-scabra; foliis plerisque alternis subconfertis petiolatis hastato-lanceolatis incisis seu laciniato-pinnatifidis subtus grosse reticulatis rigidis, summis parvis bracteiformibus; capitulis geminis ternisve breviter pedunculatis; involucri 2–3-serialis squamis ovato-oblongis vix appendiculatis; receptaculo planiusculo; ligulis integerrimis; acheniis subciliatis aristis paleæformibus 2 et squamellis latis apice eroso-dentatis 6—8 coronatis.—Rancho Gamacha, east of San Diego, California, September, 1855; *Schott.* A remarkable species, apparently a low and more or less shrubby plant, with slender branches. Leaves about 1½ inch long, including the petiole, thin but rigid, very scabrous, the coarse teeth, or lobes, ovate or triangular, blunt. Heads nearly half an inch long; rays nearly of the same length. Squamellæ of the pappus thick. Paleæ of the receptacle acutish.

ACTINOMERIS WRIGHTII, *Gray, Pl. Fendl. p.* 85, *& Pl. Wright. l. c.* Between Cobre and Conde's Camp, New Mexico, etc.; *Wright, Thurber.*

ACTINOMERIS LONGIFOLIA, *Gray, Pl. Wright.* 2, *p.* 89. Mountains east of Santa Cruz, Sonora; *Wright.*

TITHONIA TUBÆFORMIS, *Cass.* Magdalena, Sonora; *Thurber.* "Flowers orange-yellow."

HELIANTHUS CILIARIS, *DC. Prodr.* 5, *p.* 587. From the lower Rio Grande to the Gobre, etc.; New Mexico; also in Sonora, where Mr. Thurber gathered a form with remarkably broad leaves.

HELIANTHUS GROSSE-SERRATUS, *Martens;* var., *Gray, Pl. Wright.* 2, *p.* 89. Valley of the Mimbres, New Mexico; *Wright.* Between the Rio Salado and Victoria, Texas; *Schott.*

HELIANTHUS MAXIMILIANI, *Schrad.; DC. l. c.* Leon Springs, and on the Limpia; *Bigelow.* Rio Seco, Texas; *Schott.*

HELIANTHUS ANGUSTIFOLIUS, *Linn.* Between Indianola and Victoria, Texas; *Schott.*

HELIANTHUS LENTICULARIS, *Dougl. in Bot. Reg. t.* 1265. Valley of the Gila; *Schott.* Common in Texas and New Mexico.

HELIANTHUS PETIOLARIS, var. CANESCENS, *Gray, Pl. Wright.* 1, *p.* 108, *&* 2, *p.* 89. The remarkably silvery-canescent form. On the Rio Grande, below El Paso; *Wright, Bigelow,* etc.

HELIANTHUS, in *Pl. Wright. l. c.*, referred to H. petiolaris. Cobre, *Wright,* (1231,) Escondido creek; *Bigelow.* A singular and still doubtful plant.

HELIANTHUS CUCUMERIFOLIUS, *Torr. & Gray, Fl.* 2, *p.* 319. On the lower Rio Grande; *Schott.*

HELIANTHTS CUCUMERIFOLIUS, var. PRÆCOX. H. praecox, *Englm. & Gray, Pl. Lindh.* H. debilis, var. *Torr. & Gray, Fl. l. c.* Cleto creek, Texas; *Schott.*

HELIANTHUS ARGOPHYLLUS, *Torr. & Gray, l. c.* Cleto creek, between Victoria and San Antonio, Texas; *Schott.* A striking species, recently introduced into the gardens.

HELIANTHUS (HARPALIUM) TEPHRODES, (sp. nov.): humilis, pube appressissima canescens; foliis plerumque alternis ovatis petiolatis subserratis basi trinerviis, junioribus cano-argenteis; pedunculo gracili monocephalo; involucri squamis ovato-lanceolatis mucronato-acutatis; pappo e squamellis paleisve plurimis, majoribus 1—2 sæpius aristiformibus deciduis.—Mirasol del Monte, in the Californian desert of the Colorado, in sandy places by the road-side, October, 1855; *Schott.* The specimen is incomplete, and hardly sufficient for proper determination; the base of the stem and the root unknown. The stems or branches collected are scarcely a foot long, and slender. Leaves about an inch long. Scales of the involucre merely biserial. Rays about 12, yellow; disk-corollas tipped with purple. The chaffy awns of the pappus are sometimes elongated, but often one or both of them reduced to strong squamellæ, like the rest.

COREOPSIS (AGARISTA) CALLIOPSIDEA. Agarista calliopsidea, *DC. Prodr.* 5, *p.* 569. Moist and grassy plains between Monterey and Santa Barbara, California. An unpublished Peruvian species connects Agarista with Coreopsis, of which it can form only a section.

COREOPSIS CARDAMINEFOLIA, *Torr. & Gray, Fl.* 2, *p.* 346. Low places on the Limpia, Rio Grande, etc.

COREOPSIS DRUMMONDII, *Torr. & Gray,* var. Western Texas; *Wright.*

THELESPERMA FILIFOLIUM, *Gray, in Kew Jour. Bot.* 1, *p.* 252, *& Pl. Wright. l. c.* Common in Southern and Western Texas.

THELESPERMA GRACILE, *Gray, l. c.* From the Limpia to Cobre, New Mexico, and Santa Cruz, Sonora, (*Schott.*)

THELESPERMA SUBSIMPLICIFOLIUM, *Gray in Hook. Kew Jour. Bot.* 1, *p.* 252 (nom. paullo mutatum): foliis rigidis anguste lineari-filiformibus, caulinis simplicibus trisectisve, inferioribus et radicalibus interdum 5-sectis vel biternatisectis; capitulis radiatis; acheniis fusiformibus (extimis tantum tuberculato-rugosis) pappo bicorni brevissimo erecto nunc fere obsoleto coronatis. Cosmidium simplicifolium, *Gray, Pl. Fendl. p.* 86. Gravelly hills, near Sacati; *Bigelow.* San Pedro River, Sonora; *Schott.* This has been confused both with T. graciles and T. filifolium, and specimens in Wright's collection have perhaps been distributed as a form of the latter. Its rigid stems and foliage accord with the former, though the leaves are commonly less divided; but the rays distinguish it from that species, while the pappus (reduced to two exceedingly short or obsolete teeth, which are strictly erect, and slightly hairy, but not barbed) distinguishes it from both species. A nearly or quite simple leaved state of this species is my Cosmidium simplicifolium, which name, a little altered to bring it nearer the fact, it is proposed to retain.

Cosmos bipinnatus, var. parviflorus, *Gray, Pl. Wright.* 2, *p.* 90. From the Cobre, New Mexico, to Santa Cruz, Sonora; *Bigelow, Wright, Thurber.*

Bidens bipinnata, L. Chihuahua and Sonora; *Thurber.* Mountains near San Esteban, *Bigelow.* Cobre creek, *Wright.* The awns are only two, but in all other respects the same as B. bipinnata. Wright's No. 345 has the achenia mostly two-awned.

Bidens Bigelovii (sp. nov.): annua, fere glabra; caule ramoso gracile suberecto; foliis trisectis, segmentis 3–5-partitis, lobis oblongis cuneatisve paucius pinnatifido-incisis; capitulis subsolitariis longe pedunculatis; involucro glabriusculo; ligulis albidis? discum haud superantibus sæpiusve nullis; acheniis heteromorphis, exterioribus brevibus lineari-cuneatis truncatis papilloso-hispidulis scaberrimis, pappo nunc breviter 2–3-aristatis nunc brevissime bicorni vel obsoleto, cæteris angustissime linearibus lævibus (semipollicaribus) breviter 2-(raoro 3)-aristatis. Banks of the Rio Limpia; *Bigelow.* Cibolo valley, Texas, *Parry*, etc. Mountain arroyo, Rock creek and Puerto de Paysanos; *Bigelow*, (var. with the awns mostly 3 and longer.) In foliage and aspect this plant is somewhat intermediate between B. bipinnata and B. tenuisecta; in fructification it is much more like B. heterosperma, *Pl. Wright*, but the heads are twice or thrice the size. The outer achenia are truncate and rough in all the specimens. Awns of the disk-achenia 1 to 1½ line long. To this belongs No. 346 of Wright's first collection referred to, B. tenuisecta in *Pl. Wright.* 1, *p.* 109.

Bidens heterosperma, *Gray, Pl. Wright.* 2, *p.* 90. New Mexico; known only from plants raised from seeds gathered by *Wright.*

Bidens fœniculifolia, *DC.*, var. *Gray, Pl. Wright. l. c.* Northern Sonora; *Wright, Thurber.*

Bidens heterophylla, *Ort.?; Gray, Pl. Wright. l. c.* Between the San Pedro and Santa Cruz, Sonora; *Wright.*

Bidens chrysanthemoides, *Michx.* Ojo Caliente, Chihuahua; *Thurber.* San Felipe; *Schott, Bigelow.* B. helianthoides, *H. B. K.*, is probably the same species.

Heterospermum tagetinum, *Gray, Pl. Fendl. & Pl. Wright. l. c.* Mountains of the Limpia and Cobre, New Mexico, *Wright, Bigelow.* Too near H. pinnatum.

Guardiola platyphylla, *Gray, Pl. Wright.* 2, *p.* 91. Sonora, between Babocomori and Santa Cruz; *Thurber, Wright.* Sierra de Pajarito; *Schott.*

Leptosyne Douglasii, *DC. Prodr.* 5, *p.* 531; *Torr. & Gray, Fl.* 2, *p.* 355. Moist and grassy plains between Monterey and Santa Barbara, California; *Parry.* Dr. Stillman has detected a second species of this genus.*

TUCKERMANIA MARITIMA, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p* 363; *Torr. & Gray, l. c.* San Diego, California; common near the beach all around the bay, March; *Parry.* It has been introduced into the gardens from seeds gathered by Dr. *Parry,* and is a very showy plant.

SANVITALIA ABERTI, *Gray, Pl. Fendl. p.* 87. Stony hills, Cobre, New Mexico; *Bigelow, Wright, Thurber.*

SANVITALIA TRAGIÆFOLIA, *DC. Prodr.* 5, *p.* 628. On the Rio Grande above Presidio; *Schott.*

OLIGOGYNE TAMPICANA, *DC. Prodr.* 5, *p.* 529. Eagle Pass, Santa Rosa, etc., on the Rio Grande; *Bigelow, Schott.*

XIMENESIA ENCELIOIDES, *Cav.* In various forms, especially var. CANA. From the lower Rio Grande to Cobre and the Gila.

VERBESINA PODOCEPHALA, *Gray, Pl. Wright.* 2, *p.* 92. Sonora, near Santa Cruz, *Wright.* Sierra west of Santa Cruz and Tucson; *Schott.* This is nearly related to V. pedunculosa, *Schultz, Bip.* (Actinomeris pedunculosa, *DC.*, Verbesina capitaneja, Nees); but that has the leaves decurrent on the stem.

VERBESINA VIRGINICA, *Linn.* var. (V. microptera & V. polycephala, *DC.*) Lower Rio Grande, etc.; *Schott.*

ZEXMENIA TEXANA, *Gray, Pl. Wright.* 1, *p.* 112. Wirtgenia Texana, *Schultz, Bip. in Seem. Bot. Herald, p.* 304. On the San Antonio, Pecos, San Pedro, and the Rio Grande; *Bigelow, Parry,* etc. Dr. Schultz, apparently with reason, has separated this from Zexmenia, and has referred it to his African genus Wirtgenia, on account of a semilunar or roundish squamula appressed to the base of the achenium on each side, and indeed adherent to it. Here it is of soft fleshy texture when in good condition, but it dries up at length, leaving only a vestige. Dr. Schultz has overlooked the fact that the plant (varying greatly as to the wings of the achenium and the awns of the pappus) is pretty clearly Wedelia hispida, *H. B. K.*, which specific name may claim to be restored. A specimen from Schultz, gathered by Schaffner, in Mexico, near Tacubaya, is the same as a plant cultivated in the *Jardin des Plantes* in the year 1815.

ZEXMENIA BREVIFOLIA, *Gray, Pl. Wright.* 1, *p.* 112. Mountains, etc., on the Rio Grande at the great cañon, Eagle Pass, Rio Concho; *Bigelow, Parry, Schott.*

SPILANTHES NUTTALLII, *Torr. & Gray, Fl.* 2, *p.* 356, var. Western Texas, San Felipe, Piedras Pintas, Zocate creek, Los Moros, etc.; *Bigelow, Schott.*

FLAVERIA CHLORÆFOLIA, *Gray, Pl. Fendl. p.* 88. Comanche and Leon Springs, southern Texas; *Parry, Bigelow.*

FLAVERIA CONTRAYERBA, *Linn.* Along the lower Rio Grande; *Bigelow, Parry.*

SARTWELLIA FLAVERIÆ, *Gray, Pl. Wright.* 1, *p.* 122. Rio Cabeza, Texas; *Thurber.* Plain below San Carlos, Cohahuila; *Schott.*

* LEPTOSYNE STILLMANII (sp. nov.): foliis inferioribus oppositis, omnibus trifidis seu pinnato-5-partitis, segmentis rhachique planis anguste linearibus; squamis involucri externi oblongis; corollis haud annulato-barbatis; appendicibus styli fl. disci haud apiculatis; acheniis glaberrimis, radii apiculatis margine fungoso subrugoso cinctis. In the valley of the Upper Sacramento, *Dr Stillman.*

The single specimen collected is a span high, with shorter and coarser leaves than L. Douglasii, and smaller heads. The scales of the exterior involucre are broader and shorter, rather fewer, and externally sparingly bearded at their base. There is only a faint indication of the bearded ring, so manifest on the tube of the disk-corollas of L. Douglasii; nor do the achenia show a trace of the capitate hairs of that species. The appendages of the style, moreover, are very obtuse, and destitute of the abrupt and sharp tip. Still it is an undoubted congener of L. Douglasii.

Adenophyllum Wrightii, *Gray, Pl. Wright.* 2, *p.* 92. Hill sides at the Cobre, New Mexico; *Wright, Bigelow.*

Lebetina cancellata, *Cass.; DC. Prodr.* 5, *p.* 639. Prairies near Chihuahua; *Thurber.* Sonora, east of the Sierra Madre; *Schott.* The genus is probably to be reduced to Adenophyllum, as I have elsewhere suggested.

Dysodia chrysanthemoides, *Lag.* San Estaban and Rock creek; *Bigelow.* Chihuahua; *Thurber.*

Dysodia porophylloides, *Gray, Pl. Thurber, p.* 322. San Felipe, interior of California; *Thurber.*

Hymenatherum (Aciphyllæa) acerosum, *Gray, Pl. Wright.* 1, *p.* 115. Hills, etc., from San Felipe, Texas, to New Mexico and Sonora.

Hymenatherum Wrightii, *Gray, Pl. Fendl. & Pl. Wright. l. c.* Common in western Texas.

Hymenatherum polychætum, *Gray, l. c.* Prairies, from Presidio del Norte to Cobre, New Mexico.

Hymenatherum pentachætum, *DC.; Gray, l. c.* Rocky or gravelly hills, from lower Texas to Sonora.

Hymenatherum tenuifolium, *Cass.; Gray, l. c.* Gravelly plains, lower Texas to Chihuahua and Sonora.

Hymenatherum Gnaphaliopsis, *Gray, l. c.* Plains, from the lower Rio Grande to New Leon. In the distribution of Berlandier's collection this occurs under the Nos. 962, 1404, 1407, 1861, 2392. (No. 14076 in *DC. Prodr.* is a typographical error for 1407.) "Called *Lepiana* by the Mexicans, and used by them and the Indians as a remedy for catarrh." *Schott.*

Lowellia aurea, *Gray, Pl. Fendl. l. c.* On the Limpia; *Wright, Bigelow, &c.*

Chrysactinia Mexicana, *Gray, l. c.* Hills of the San Pedro, Limpio, etc., Texas and New Mexico.

Nicolletia Edwardsii, *Gray, Pl. Wright.* 1, *p.* 119, *t.* 8. Gravelly plains, Presidio del Norte, Arroyo San Juan, etc.; *Bigelow, Parry.* Called "Yerba Venado" by the Mexicans.

Tagetes micrantha, *Cav.; Gray, l. c.*, 2, *p.* 93 Cobre, New Mexico; *Wright, Bigelow.**

CLAPPIA, Nov. Gen.

* At Laredo, on the Lower Rio Grande, in August, 1829, Berlandier (as appears from the remains of his collections bough from his widow) gathered a few specimens of a Composita of doubtful affinity. The specimens were not numbered, and doubtless have not been distributed by him. It is to be sought on the lower part of the Rio Grande. The plant appears to be the type of a new genus, which I dedicate to Dr. A. Clapp, of New Albany, Indiana, one of the most zealous botanists of our Western States, and the author of an important work, entitled "A Synopsis or Systematic Catalogue of the Medicinal Plants of the United States, 1852."

Capitulum multiflorum, heterogamum; ligulis fœmineis; fl. disci hermaphroditis, corollis tubulosis, limbo 5-fido. Involucrum imbricatum, pauciseriale; squamis laxis ovalibus obtusissimis lineatis. Receptaculum convexum, epaleatum, setoso fimbrilliferum. Antheræ ecaudatæ. Styli rami fl. herm. angusti, glabri, cono brevissimo obtuso superati. Achenia subangulata, 10-costata. Pappus simplex, e setis rigidis seu paleis angustissimis 20—25 hispido-serrulatis, disci corollam subaequans. Herba ramosa, glabra, foliis carnosis alternis confertis filiformibus obsolete parceque glanduloso-punctatis, ramis floridis apice nudis monocephalis; floribus ut videtur flavis.

Clappia suædæfolia.—Herb a foot or more in height, probably from a perennial root and fleshy stems, and with fleshy leaves much resembling those of Suæda or Chenopodina maritima. Peduncles 2 or 3 inches long, somewhat thickened above; the head half an inch in diameter. Scales of the involucre consimilar, but the outer successively shorter, distinct, marked with several dark impressed lines apparently of a glandular nature; the margin narrowly scarious. Fimbrillae of the receptacle as long as the ovaries. Ligules 10 or 12, linear, tridenticulate at the apex Lobes of the disk-corollas oblong-lanceolate. Achenia a line and a half long, truncate at the broad summit, minutely and sparsely hispid. Pappus ferrugineous, rigid, rather

Porophyllum macrocephalum, *DC. Prodr.* 5, *p.* 648. Sonora, on the Sonoita; *Wright.* Near Santa Cruz; *Thurber.*

Porophyllum Greggii, *Gray, Pl. Wright,* 1, *p.* 120. Dry hills, etc., southern part of New Mexico and adjacent districts in Chihuahua; *Wright, Bigelow, Captain Smith.* On the Colorado of the West; *Schott.*

Porophyllum scoparium, *Gray, l. c.* On the San Pedro and Puercos, El Paso, etc.; *Wright, Bigelow, Thurber.*

Agassizia suavis, *Gray & Engelm. Pl. Lindh.* 2, *p.* 229. Gravelly hills, southern and western Texas, on Rock creek, etc.; *Parry, Bigelow.*

Gaillardia pinnatifida, *Torr.* Common from Rock creek, the Pecos, etc., to El Paso, Cobre, etc., New Mexico.

Gaillardia pulchella, *Foug.; Torr. & Gray, l. c.* Common from Texas to Sonora.

Gaillardia lanceolata, *Michx.* Eastern Texas, on the coast; *Schott.*

Palafoxia linearis, *Lag.; DC. Prodr.* 5, *p.* 124. Diluvial banks of the Colorado, Sonora; *Schott.* Fort Yuma, California; *Major Thomas.* Chihuahua, east of Rio Santa Maria; *Schott.*

Palafoxia Hookeriana, *Torr. & Gray, Fl.* 2, *p.* 368. Valley of the Rio Grande below San Elizario; *Wright, Bigelow.* Sand hills, Medanos; *Thurber.*

Palafoxia Texana, *DC. Prodr.* 5, *p.* 125. Texas from San Antonio to Eagle Pass. Los Moros, New Mexico; *Bigelow.*

Palafoxia callosa, *Torr. & Gray, l. c.* From the Guadalupe river, Texas, to the Pecos.

Florestina tripteris, *DC. Prodr.* 5, *p.* 655. On the Pecos, Escondido, etc.; *Bigelow, Wright, Parry.*

Chænactis tenuifolia, *Nutt.; Torr. & Gray, Fl.* 2, *p.* 370. San Diego, California; *Thurber,* (a pretty large plant, a foot high,) *Schott,* (a small form, only 3 or 4 inches high.)

Chænactis stevioides, *Hook. & Arn.*; *Gray, Pl. Wright.* 2, *p.* 94. Hills, near Camp Fillmore, New Mexico; *Bigelow, Wright,* Cooke's spring, New Mexico; *Thurber.*

Chænactis carphoclinia (sp. nov.): annua? lanuloso-pubescens, mox glabrata, subviscosa; caule ramosissimo; foliis 1–2-pinnatipartitis, segmentis parvis linearibus (1–3 lin. longis); capitulis subcorymbosis; involucro viscoso; corollis albidis? radii limbo ampliato sed regulari discum haud superantibus, pappi paleis 4 ovato-lanceolatis acuminatis; receptaculo paleis nonnullis setaceis involucrum aequantibus inter flores onusto.—Gila and Colorado desert; *Schott.* Fort Yuma, E. California; *Major Thomas.* Plant 4 to 9 inches high, resembling slender forms of C. stevioides. Heads corymbose-panicled, half an inch long, on short and slender peduncles, 12—25-flowered. Involucre either glandular-viscid or hirsute with viscid hairs. The remarkable peculiarity of the species consists in a set of filiform or setaceous persistent paleæ on the receptacle, 5 to 10 in number, subtending as many disk-flowers; but in every other respect the plant is a true Chænactis.

Hymenopappus luteus, *Nutt.; Gray, Pl. Fendl. p.* 97. Stony hills, Cobre, New Mexico; *Bigelow, Wright;* and Mimbres; *Thurber.* Guadalupe cañon; *Captain Smith.* Cordilleras

longer than the achenium; the bristles, or rather aristiform paleae, consimilar, except that a few are smaller, tapering upwards, simple, but all more or less coherent at the very base, so that they fall off in a ring. There are faint indications of some dark glands on the foliage, which, if confirmed in better specimens, may justify a reference of the genus to the Tagetineæ, in which case it would make as perfect a transition between that subtribe and the Helenieæ as another genus of the same region (Sartwellia) does between the latter and the Flaverieæ.

behind San Diego; *Parry;* (a somewhat glabrate form.) Nuttall's original specimens are depauperate and not fully developed; they gave rise to the unfortunate phrase "heads small," in the Flora of North America. But, in fact, they are perhaps the largest of the genus. The conspicuous pappus at length projects beyond the villosity of the achenium.

HYMENOPAPPUS FLAVESCENS, *Gray, Pl. Fendl. l. c.* Common from the Pecos to El Paso, etc.

HYMENOPAPPUS CORYMBOSUS, *Nutt.; Torr. & Gray, Fl.* 2, *p.* 370, and var.? NUTTALLII. On the San Pedro and Rio Grande, etc., Texas; *Bigelow, Schott.*

ACARPHÆA ARTEMISIAEFOLIA, *Harv. & Gray, in Pl. Fendl. p.* 98, *in not.* (TAB. XXXII.) Cordilleras east of San Diego, California, June; *Parry.* This rare plant was known only from a specimen in Coulter's Californian collection, No. 313, which presented no mature fruit. Dr. Parry's specimen is also a single one, (*more suo,*) but with well-formed fruit. The only points to be added to the original account of the plant are that the viscid-glandular leaves are scarcely, if at all, hoary; the corollas appear as if they were flesh-color rather than pale yellow, and the marginal ones are hardly ampliate; the mature achenia, all fertile and similar, are slightly incurved, compressed, and not manifestly striate. The compression of the achenia tends to confirm the genus as distinct from Chænactis, although the numerous analogous cases in this subtribe warn us to beware of genera resting solely on the absence of pappus. Vide, *Plantae Wrightianæ,* 1, *p.* 123.

BAHIA (ERIOPHYLLUM) ARTEMISIÆFOLIA, *Less.; DC. Prodr.* 5, *p.* 567. Monterey, etc., California; *Parry.* A shrubby plant, 2 or 3 feet high.

BAHIA (ERIOPHYLLUM) TRIFIDA, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p.* 374; *Torr. & Gray, l. c.* Dry sandy hills, San Diego, California; *Parry.*

BAHIA (ERIOPHYLLUM) CONFERTIFLORA, *DC. l. c.; Torr. & Gray, l. c.* Dry places near Santa Barbara, California; *Parry,* etc. From San Diego to the Colorado; *Schott.*

BAHIA RUBELLA (sp. nov.): annua, pumila, floccoso-lanuginosa, ramosa; pedunculis subcorymbosis monocephalis; foliis alternis spathulatis apice sæpius tridentatis; involucro campanulato 8-phyllo lanuginoso, squamis erectis discum adæquantibus; ligulis 8 roseis ovalibus 3–4-dentatis; appendicibus styli fl. disci cono acutissimo superatis; receptaculo conico; acheniis hirsutulis; pappi paleis 8 enerviis obtusissimis.—Interior of California, in a dry valley, near San Felipe, (between San Diego and the Rio Colorado;) June; *Parry.* Plant 4 inches high; the leaves half on inch long. Peduncles from half an inch to an inch in length. Involucre 3 lines long. Disk-flowers 14–20, yellow. Ligules oval, deeply notched or 3–4-toothed at the apex. Pappus about one-quarter the length of the prismatic achenium; the paleae of equal length, four of them obovate-oblong, the alternate ones narrower and more spatulate, entire. With the style of true Bahia, but the appendages tipped with a longer and sharper cone, this little plant has the involucre of the section Eriophyllum, and a still more elevated (even conical) receptacle; and so tends to combine the two. In the rays, which are said to be pale purple and white, it accords with the obscure B. trolliifolia, of which it is probably a true congener.

BAHIA ABSINTHIIFOLIA *Benth.,* var. DEALBATA, *Gray, Pl. Wright.* 1, *p.* 121. Sandy or gravelly soil, from the San Felipe to the Mimbres, and south to Chihuahua, etc.

BAHIA BITERNATA, *Gray, Pl. Wright.* 2, *p.* 95. Ojo de Gavilan, etc., New Mexico; *Wright, Thurber, Bigelow.* Llanos del Babuquibari, Sonora; *Schott.*

BAHIA PEDATA, *Gray, Pl. Wright*, 1, *p.* 123. On the Pecos, Limpia, etc.; *Thurber, Wright.*

BAHIA (ACHYROPAPPUS) BIGELOVII (sp. nov.): annua, striguloso-puberula; caulibus gracilibus diffuse ramosis; foliis oppositis tripartitis, segmentis integerrimis vel inferiorum 2–3-fidis lineari-filiformibus; pedunculis filiformibus monocephalis; involucri laxi squamis 8–9 oblongo-ovatis obtuse acuminatis glanduloso-pubescentibus; ligulis totidem oblongis; acheniis basi hirsutulis; pappi paleis 8 obovatis obtusissimis enerviis tubo corollæ disci viscoso-hispido fere dimidio brevioribus. Valley of the Limpio, W. Texas; July, 1852; *Bigelow.* Stems branched from the base a foot or more in height. Leaves short-petioled; their divisions 6 to 12 lines long. Peduncles solitary, 3 or 4 inches long. Involucre scarcely 3 lines in length, a little shorter than the disk. Flowers yellow; those of the disk as many as 30; their corolla a line and a half long; the slender and glandular-hispid tube abruptly dilated into the cyathiform 5-lobed limb. Style as in B. ambrosioides. Achenia linear-clavate, obtusely tetragonal, nearly a line and a half long. This is nearly related to the Schkuhria? Neo-Mexicana, *Gray, Pl. Fendl. p.* 96; which, however, is rayless and has disk-corollas scarcely longer than the pappus. While on the one hand it is plainly a congener of Achyropappus schkuhrioides, *Link & Otto.*, (which in specimens from De Candolle and others, contrary to the generic character, taken from A. anthemoides, has a pappus very much shorter than the corolla,) on the other it is equally inseparable from true Bahia (B. ambrosioides, B. absinthifolia, etc.) I am unable to say exactly how the various species are to be divided between Bahia and Schkuhria; but apparently all the many flowered ones must be excluded from the latter.

AMBLYOPAPPUS PUSILLUS, *Hook. & Arn. in Hook. Jour. Bot.* 3, *p.* 321, (vide *Gray, Pl. Wright*, 1, *p.* 123, *in adn. & Bot. Whippl. Rep. p.* 106.) Infantea Chilensis, *Remy, in Gay, Fl. Chil.* Aromia tenuifolia, *Nutt. in Trans. Amer. Phil. Soc.* 1, *p.* 395. Monterey, California, near the seaside, forming dense clumps; *Parry.*

VILLANOVA CHRYSANTHEMOIDES, *Gray, Pl. Wright*, 2, *p.* 96. Cobre, New Mexico; *Bigelow, Wright.*

SCHKUHRIA HOPKIRKIA, *Gray, l. c.* Sonora; *Wright.* Seeds only were collected, from which plants were raised for two seasons.

SCHKUHRIA WRIGHTII, *Gray, l. c.* Sandy soil, between Babocomori and Santa Cruz, Sonora; *Wright, Thurber.*

AMBLYOLEPIS SETIGERA, *DC.*; *Gray, l. c.* Plains of Texas, from the Leona to the Pecos and Eagle Pass; *Bigelow, Wright, Schott.*

RIDDELLIA TAGETINA, *Nutt; Torr. in Emory, Rep. t.* 5. Texas to Sonora; common on the frontier.

RIDDELLIA ARACHNOIDEA, *Gray, Pl. Fendl. p.* 94, *& Pl. Wright,* 1, *p.* 121. Common on the Rio Grande, etc., from the Nueces (where it was also gathered by *Berlandier*, No 1041, 2471) to the Mimbres, etc.

HYMENOTHRIX WISLIZENI, *Gray, Pl. Fendl. l. c.* Mule Springs, etc., New Mexico, and Sonora; *Bigelow, Wright.*

HYMENOTHRIX? WRIGHTII, *Gray, Pl. Wright*, 2, *p.* 97. Sonora; *Wright, Schott, Bigelow, Thurber*, mostly in the mountains. New Mexico, at the Cobre, Organ mountains, etc.; *Bigelow.*

ACTINOLEPIS MULTICAULIS, *DC. Prodr.* 5, *p.* 655; *Torr. & Gray, Fl.* 2, *p.* 376. (TAB. XXXIII.) Dana's Ranch, below San Luis Obispo, California; *Parry.*

BURRIELIA LANOSA, *Gray, in Bot. Whipp. Rep. p.* 107. Sonora, between Tucson and the Gila; *Parry.* Pappus of 4 long and 4 short paleæ in the disk-flowers, but of five each in the ray.

Burrielia gracilis, *DC. Prodr.* 5, *p.* 664. California, near Monterey, etc.; May ; so abundant as to give a yellow appearance to the hills ; *Parry.* Mostly rather large forms. In one specimen a slight disposition to have lobes to the leaves appears.

Burrielia chrysostoma, *Torr. & Gray. Fl.* 2, *p.* 379. Hill sides, common from Monterey to San Diego, California. The specimens occur mixed with the preceding, from the larger forms of which they are externally undistinguishable. Unless the more obtuse receptacle affords a character, it will probably come to be regarded as only an epappose state of B. gracilis.

Burrielia platycarpha (sp. nov.) : erecta, spithamæa, subramosa, laxe pubescens ; foliis sæpissime trifidis segmentisque filiformi-linearibus ; pedunculis sursum incrassatis ; involucri multiflori squamis ovatis trinerviis ligulisque oblongo-linearibus sæpius 7 ; corolla imberbi ; pappo conformi e paleis 7-8 oblongo-ovatis aristatis achenio æquilongis ; receptaculo acute conico.—Valley of the upper Sacramento ; *Dr. Stillman.* This is a genuine Burrielia, having the paleæ of the pappus all alike and awned. The scales of the involucre (fully 4 lines long) and the ligules are considerably larger than those of the largest states of B. gracilis and B. (Bäeria) chrysostoma, although fewer. It is related on the one hand to B. gracilis, from which it is a once distinguished by its lobed leaves, stouter peduncles, more upright habit, fewer rays and involucral scales, the latter much broader as well as larger, 3-nerved and more pointed, and by the equally larger and broader as well as more numerous paleæ of the pappus ; on the other to B. (Dichæta) Fremontii, which has much smaller heads, a dimorphous pappus of much smaller paleæ, etc.*

Burrielia (Ptilomeris) anthemoides. Ptilomeris anthemoides, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p.* 382. Hymenoxys (Oxypappus) calva, *Torr. & Gray, Fl.* 2, *p.* 381. Grassy places, Monterey, California; *Parry.*

Lasthenia (Hologymne) glabrata, *Lindl. Bot. Reg. t.* 1780. Monterey, California ; *Parry.*

Monolopia major, *DC. Prodr.* 6, *p.* 74. Argillaceous hills, San Fernando, beyond Los Angelos, California (a glabrate form) ; *Parry.*

TRICHOPTILIUM, Nov. Gen.

Capitulum homogamum multiflorum ; floribus hermaphroditis tubulosis. Involucrum circiter 10-phyllum, biseriale ; squamis æqualibus membranaceis, interioribus glandula apiculatis. Receptaculum nudum, scrobiculatum. Corolla cylindrica ; tubo proprio brevi angusto, dentibus 5 patentibus ovatis. Antheræ ecaudatæ. Styli rami compressi, glaberrimi, apice tantum capitellato-truncato brevissime hirtelli. Achenia immatura oblonga, basi angustata, hirsutissima. Pappus corolla brevior, e paleis 5 hyalinis enerviis oblongo-lanceolatis in setas plurimas rigidas profunde fissis. Herba nana, hyemo-annua vel biennis, dichotoma, humifusa, floccoso-lanata, subglandulosa ; foliis alternis cuneato-oblongis argute inciso-dentatis lobatisve, dentibus cuspidato-acuminatis ; pedunculis terminalibus et alaribus filiformibus monocephalis ; corollis ochroleucis?

Trichoptilium incisum, *Gray, Mss. ; Torr. in Pacif. R. Road Expl.* 6, *p.* 361, *t.* 5. Psathyrotes incisa, *Gray, Pl. Thurber, p.* 322. On the desert of the Colorado, in the southeastern part of California, near the Colorado; *Thurber.* Near Fort Yuma; *Lieut. Du Barry.* Only a single specimen of this interesting plant (but in a more advanced state than Mr. Thurber's) was gathered by Lieut. Du Barry, and communicated to Dr. Torrey. The latter pointed out the oversight I had committed in respect to the pappus, and which led me wrongly to refer the plant to Psathyrotes, whereas it technically belongs to the Helenieæ, and adds another genus to that subtribe. The five thin paleæ of the pappus are beautifully dissected into stiff capillary bristles, of which the central one is somewhat the longest, and the rest on each side successively shorter. Involucre loosely very woolly externally; the thin and lax scales oblong and oblong-lanceolate, nerveless, and about as long as the disk.

---

* It may be remarked that Mr. Bentham refers No. 1791 of Hartweg's Californian collection to Burrielia (Dichæta) Fremontii ; but all the specimens in my set are entirely destitute of pappus, which could not have been the case in those which Mr. Bentham examined. Since the two plants apparently agree in all other particulars, it is most likely that my specimens belong to an epappose state of the species ; just as all Nuttall's species of Ptilomeris are probably forms of one. At any rate, it is now certain that Ptilomeris and Dichæta, as well as Bäeria, must be reduced to sections of Burrielia.

HULSEA, Torr. & Gray, (Nov. Gen.)

Capitulum multiflorum, radiatum; floribus radii ligulatis fœmineis, disci tubulosis. Involucrum hemisphæricum; squamis subtriseriatis membranaceis laxis, extimis paullo brevioribus. Receptaculum planum, epaleaceum, alveolato-dentatum, dentibus brevibus corneis. Ligulæ 20–30, lineares. Corollæ fl. herm. tubo gracili viscoso-glanduloso, fauce cylindraceæ, limbo 5-dentato, dentibus triangulari-ovatis fere glabris. Antheræ ecaudatæ. Styli rami obtusi, longitrorsum puberuli, exappendiculati. Achenia conformia, linearia, subtetragono-compressa, deorsum attenuata, villosa præsertim ad margines. Pappus (villis achenii vix longior) e paleis 4 tenuibus hyalinis enerviis latis obtusissimis erosis vel fimbriatis. Herbæ perennes, viscoso-pubescentes, macrocephalæ, alternifoliæ; caule florifero sub-aphyllo; floribus flavis.

H. CALIFORNICA (*Torr. & Gray*): elata; caule vel pedunculo 3–7-cephalo; involucri squamis linearibus apice attenuatis; floribus aureis; ligulis sæpe filamentis sterilibus instructis; pappi paleis cuneato-rotundis apice truncato eroso-denticulatis.—Mountains east of San Diego, California, in bushy places, June; *Parry.* A portion of the inflorescence was alone gathered of this interesting plant, apparently a branch of a tall herb, with the alternate leaves reduced to ovate-lanceolate and sessile bracts, of about half an inch in length. The paniculate or subcorymbose heads are about as large as those of Arnica montana. Ligules half an inch long. Disk-flowers perhaps 100. Achenia 3 lines long, blackish, minutely striate on each face, also villous (but much more so on the margins) with long and thick hairs. Pappus of four nearly equal, thin, and hyaline paleæ, of less than a line in length, much shorter than the tube of the corolla. Foliage, etc., unknown. The genus is dedicated to G. W. Hulse, M. D., of Louisiana, late a surgeon of the United States army, and a zealous cultivator of botany, to whom we are indebted for many interesting plants of Florida, California, etc. Since its establishment upon a single and incomplete specimen, a second species has been detected by Dr. Newberry (H. nana, *Gray in Pacific R. R. Report,* 6, *p.* 76, *t.* 13,) confirming the genus. The broad and flat receptacle and the elongated compressed achenia are remarkable in the Helenieæ, subdiv. Euhelenieæ, to which the genus is to be referred.

HELENIUM AUTUMNALE, *Linn.* Texas; west to the San Pedro; *Bigelow.*

HELENIUM PUBERULUM, *DC. Prodr.* 5, *p.* 667; *Torr. & Gray, Fl.* 2, *p.* 385. California; not uncommon. Rio Fronteras, Sonora; *Thurber.*

HELENIUM TENUIFOLIUM, *Nutt.; Torr. & Gray, l. c.* Sonora; *Capt. Smith.*

HELENIUM MICROCEPHALUM, *DC. l. c.* Sandy moist places, Presidio del Norte, Van Horne's

Wells, etc., *Bigelow*. This species includes De Candolle's H. elegans and his H. heterophyllum, at least in part, viz: No. 2113 of Berlandier's collection, which is from Reynosa. De Candolle also cites Berlandier's No. 107 and No. 190, and the habitat Tampico. I have no specimens from that station. From these the character, "pappi paleis breviter aristatis," may have been drawn. But in those from Reynosa the paleæ are very obtuse and pointless, just as in H. microcephalum.

ACTINELLA RICHARDSONII, *Nutt.; Gray, Pl. Fendl., p.* 101. New Mexico and western Texas, abounding on stony hills.

ACTINELLA ODORATA, *Gray, l. c., & Pl. Wright. l. c.* From the lower Rio Grande to Sonora, the Gila, etc.; *Parry, Bigelow, Schott.* "Limonillo" of the Sonorians.

ACTINELLA CHRYSANTHEMOIDES, *H. B. K.; Gray, Pl. Wright.* 1, *p.* 122, *adn.* Soccoso, Sonora; *Bigelow.*

ACTINELLA SCAPOSA, *Nutt.; Gray, l. c., & in Bot. Whippl. Rep. p.* 108. Gravelly or rocky hills, throughout western Texas and New Mexico; in diverse forms.

ACTINELLA ARGENTEA, *Gray, Pl. Fendl. l. c.* On the Mimbres; *Bigelow, Dr. Henry.*

ACTINELLA BIGELOVII, *Gray, Pl. Wright.* 2, *p.* 96, *adn.* New Mexico, on Ben More, and near the Cobre, etc.; *Bigelow.*

ACTINELLA LINEARIFOLIA, *Torr. & Gray, Fl.* 2, *p.* 382. Western Texas to El Paso and Eagle Pass, etc.; in various forms.

TRIDAX BICOLOR, *Gray, Pl. Fendl. p.* 104. Bachimba, Chihuahua; *Thurber.* Plant taller than the specimens of Wislizenus, a foot or two high; the upper leaves alternate and on pretty long petioles; head larger than in *T. procumbens*; rays rose purple; pappus not tinged with purple.

GALINSOGA PARVIFLORA, *Cav.;* var. CARACASANA, and var. SEMICALVA; *Gray, Pl. Wright,* 2, *p.* 98. Cobre, New Mexico; *Wright.*

ACHYRACHÆNA MOLLIS, *Schauer; DC. Prodr.* 7, *p.* 292. Monterey, California; in grassy places; *Parry, etc*

LAYIA (CALLICHROA) PLATYGLOSSA, *Gray, Pl. Fendl., p.* 103. California, San Pasqual; *Thurber.* Monterey, etc.; *Parry.* Colorado desert; *Schott.*

LAYIA (CALLIACHYRIS) FREMONTII, *Gray, Pl. Fendl. l. c.* Upper Sacramento, California; *Dr. Stillman.*

LAYIA (MADAROGLOSSA) HETEROTRICHA, *Hook. & Arn. Bot. Beech.; Gray, l. c.* Dana's Ranch, below San Luis Obispo, California; in dry gravelly soil; *Parry.*

LAYIA (MADAROGLOSSA) HIERACIOIDES, *Hook. & Arn. l. c.* San Juan Battista, near Monterey, California; *Parry.* Remarkable for its very short rays.

LAYIA (MADAROGLOSSA) CARNOSA, *Nutt. in Torr. & Gray, Fl.* 2, *p.* 394. Sea beach, Monterey, California; *Parry.* The very small rays appear to be white.

LAYIA (MADAROGLOSSA) NEO-MEXICANA, *Gray, Pl. Wright.* 2, *p.* 98. New Mexico; *Bigelow.* Tucson, Chihuahua; *Parry.* The pappus is not always present in the ray-flowers.

OXYURA CHRYSANTHEMOIDES, *DC. Prodr.* 5, *p.* 693. Monterey, California; May; on grassy hill sides.

HEMIZONIA FASCICULATA, *Torr. & Gray, Fl.* 2, *p.* 397. Hartmannia fasciculata, *DC. Prodr.* 5, *p.* 693. Dry plains, San Diego, California; *Parry, Schott, Thurber.* Covers large tracts, and exhales a strong balsamic odor.

Hemizonia ramosissima, *Benth. Bot. Voy. Sulph. p.* 30. Santa Barbara and San Diego, California; *Schott, Fitch.* This appears to be a common Californian plant, of somewhat variable mode of growth. Mr. Fitch's specimen is the same as Frémont's, marked R and S in his coll. of 1846; as No. 361 of Coulter's Californian collection; and as the *H. fasciculata* of Nuttall, in herb. Hook; (of Gambell's collection, a stricter and smoother form); I believe it is also Bentham's H. ramosissima. The sessile or stipitate glands are sometimes abundant, but not rarely wanting or nearly so. I may remark that to H. angustifolia, *DC.*, (which has no pappus at all, at least in Douglas's specimens,) belongs the H. multicaulis, *Hook. & Arn. Bot. Beech. Voy. Suppl., p.* 355; the No. 305 of Coulter's Californian collection; H. decumbens, *Nutt. Pl. Gamb. p.* 175; and apparently the same as specimens gathered near Monterey by Mr. Barclay, although their disk-flowers show a minute pappus. But No. 1797 of Hartweg's collection, referred by Mr. Bentham to H. angustifolia, is exactly H. corymbosa (Hartmannia corymbosa, *DC.*) H. macrocephala, *Nutt. Pl. Gamb. l. c.*, appears to be the same species. H. congesta, *DC.*, is to be distinguished from Madaria chiefly by the shape of the fertile achenia; as noted in the Botany of Whipple's Report [*]

Calycadenia (Osmadenia) tenella, *Torr. & Gray, Fl.* 2, *p.* 402. Osmadenia tenella, *Nutt.* Dry places near San Diego, California; *Parry, etc.;* June. Subjoined are the characters of two new species, from Frémont's Californian collection of 1846.[†] They belong to Nuttall's Osmadenia, but have the glands of Calycadenia on the floral and young fascicled leaves, and

---

[*] Besides H. Fitchii, recently published in Whipple's Report, there is another extremely well marked species of Hemizonia in Colonel Frémont's collection, the characters of which are subjoined:

Hemizonia virgata (sp. nov.): subglabra; caulibus e radice annua ramisve simplicibus gracilibus; foliis linearibus, inferioribus inciso-dentatis basi longe attenuatis, superioribus integerrimis, summis minimis apice glanduloso-truncatis; capitulis oblongis in axillis solitariis subsessilibus vel plerumque ramulos breves foliosos desinentibus racemum virgatum efficientibus; involucri squamis circiter 5 ovatis membranaceis cum paleis extimis receptaculi glandulis stipitatis mollibus dorso muricatis; floribus ut videtur luteis, radii 5 ligula cuneato-rotunda apice triloba, disci 10 sterilibus, singulis palea oblonga glanduloso-mucronata amplexatis epapposis; acheniis radii fertilibus obovatis lævibus basi substipitatis apice intus breviter rostratis.—California, probably on the Sacramento; *Col. Frémont.*—Stems a foot or more high. Lower cauline leaves two inches long, the upper ones an inch or less in length and barely a line wide; those fascicled in the axils or crowded on the floral branchlets 1–2 lines wide, spreading; their truncate apex glandular. Heads 3 lines long. Scales of the involucre ovate, cymbiform, half inclosing the fertile achenia, glabrous, beset externally with long and soft glandular-tipped but truncate spreading processes. Ligules 2 lines long and the same width, on a glandular tube of a line in length. Disk-flowers slightly glandular, their infertile ovaries glabrous, destitute of pappus. Receptacle chaffy thoughout; the paleæ distinct, membranaceous.

[†] Calycadenia Fremontii (sp. nov.): caule humili superne parce paniculato-ramoso et hirsuto; foliis anguste linearibus scabris basi setoso-hispidis, caulinis eglandulosis, floralibus apice sæpe glandulam claviformem breviter stipitatam gerentibus; capitulis solitariis terminalibus axillaribusque subsessillibus; ligulis 5–7 tripartitis, segmentis tubulo brevissimo glabra 2–3-plo longioribus; disco circiter 20-floro; paleis receptaculi 12 et ultra oblongis obtusis vix glutinosis connatis; lobis corollarum disci ovatis; acheniis radii lævibus utrinque obtusis, disci hirsutulis pappo 10-paleaceo (paleis alternis subulato-productis) aequilongis.—California, (the particular station not recorded;) *Col. Fremont.* Stems a span high, from an annual root, erect, rather slender; the branches are not glandular nor glutinous. Cauline leaves an inch or more in length, the lower opposite. Heads few, larger, and with many more flowers than in C. tenella; also with much ampler ligules, (though the tubular portion is very much shorter,) their obovate or oblong segments 3 lines long. Nor are the tinged and perfectly smooth and even ray achenia at all apiculate at either end. The pappus of the (apparently fertile) disk-achenia resembles that of C. tenella, its longer and subulate scales being only half the length of the corolla, and not longer than the achenium itself.

Calycadenia pauciflora (sp. nov.): caule paniculato-ramoso glabello; ramis floriferis diffusis filiformibus flexuosis capitula solitaria subsessilia ad nodos singulos gerentibus; foliis anguste linearibus scabris inferne setoso-ciliatis, floralibus cum iis in axillis fasiculatis brevibus glandula claviformi superatis; radio uni-ligulato, lobis ligulæ tripartitæ tubulo duplo longioribus; disco

one of them has short and broad lobes to the corolla of the disk. The glands are manifestly not of generic importance; and as in habit there is no longer a marked distinction, it will be evident, on comparing the characters of C. Fremontii with those of the two new Hemizoniæ above described, that it is becoming increasingly difficult to preserve Calycadenia as a genus.

Lagophylla dichotoma, *Benth. Pl. Hartw. p.* 317. On the Sacramento, California; *Rev. Mr. Fitch.* Branchlets only; rays evidently yellow. The genus is distinguished from Hemizonia by the obcompressed fertile achenia, completely enclosed by the involucral scales, and by the cuneiform, deeply trifid rays. The habit also is peculiar. Yet, perhaps, it may be found to pass into Hemizonia; though it is more distinct than Calycadenia.

Lagophylla filipes, *Gray in Bot. Whippl. Rep. p.* 109, *adn.* Hemizonia filipes, *Hook. & Arn. Bot. Beech. Voy. Suppl. p.* 356. On the Sacramento, California; *Rev. Mr. Fitch.* The specimens are merely in flower. I suspect that in the achenia, no less than in other characters, as well as in habit, the plant will accord with *Lagophylla,* and thus raise that genus to three known species. The receptacle is not chaffy in the centre. The small rays are three-parted nearly to the base.

Madia sativa, *Molina.* In springy places, California, near Monterey; April.

Harpæcarpus exiguus: tenellus, diffusus; pedunculis filiformibus; paleis receptaculi 3 in cupulam florem hermaphroditum includentem coalitis; acheniis haud rostratris.—Sclerocarpus exiguus, *Smith in Rees Cycl.; Hook. & Arn. Bot. Beech, Voy. p* 355, *adn.* California, (probably Mariposa county,) *Rev. Mr. Fitch.* Plant 2 to 4 inches high, including the fruit-bearing peduncles (which are an inch or more long); the branches diffuse. Root annual. Leaves from a quarter to half an inch long. Heads little over a line long, with 4 to 7 ray-flowers, and a single hermaphrodite one, which is inclosed in a cup formed of only three paleæ. Besides this character, and the diminutive size and diffuse habit of this plant, it differs from H. madarioides, *Nutt.*, of Oregon, in the less falcate ray-achenia, of barely a line in length (only half the size of those of the other species), the apex of which is obtusely apiculate, but not at all rostrate. H. madarioides has, when young, a simple and strict stem, leaves of one or two inches in length, and, according to Nuttall, sometimes attains the height of 2 feet.

Coinogyne carnosa, *Less.; DC. Prodr.* 6, *p.* 42. Salt places and seashore near San Diego California; *Parry.* The genus should stand next to Jaumea, in the Helenieæ, from which it differs principally in the want of the pappus.

Baileya pauciradiata, *Harv. & Gray, in Pl. Fendl. p.* 105. Diluvial banks of the Colorado, Sonora; February, 1855; *Schott.* These are the only specimens of this plant I have seen, excepting the original ones in Coulter's collection. They possess the lower cauline and radical leaves, which are pinnatifid, with few and unequal linear lobes, some of them 1–2-toothed or lobed. The root is that of a biennial or winter annual.

Baileya pleniradiata, *Harv. & Gray, l. c., & Pl. Wright. l. c.* Very common from the Rio Grande to the Colorado, Sonora, etc.

tripaleato trifloro, corollæ lobis oblongis; achenio radio lævi obtuso, iis disci hirsutulis pappo 10-paleaceo (paleis alternis subulato-productis) longioribus.—California; *Col. Frémont.* This species presents nearly the habit of C. tenella, except that the prolonged branches are simple or sparingly forked, and bear lateral nearly sessile heads; and they are scarcely, if at all, glandular or viscid. The heads are still smaller, or at least narrower, and, as far as examined, have unformly only one ray and three disk flowers; the latter surrounded by a cup formed of the thin coalescent paleæ. Pappus nearly as in C. Fremontii. Ray-achenium rather acute at the base, but the summit not at all apiculate.

Baileya multiradiata, *Harv. & Gray, l. c.; Pl. Wright. l. c.* Sandy places, with the same range as the foregoing, which may probably pass into it.

Matricaria discoidea, *DC. Prodr.* 6, *p.* 37; *Torr. & Gray, Fl.* 2, *p.* 413. A common weed in the streets of Monterey and elsewhere in California, appearing as if introduced; *Parry.*

Achillea Millefolium, *Linn.* Cobre, New Mexico; *Bigelow, Wright.*

Varilla Texana, *Gray, Pl. Wright.* 1, *p.* 123. Plains and grassy places near Eagle Pass on the Rio Grande; *Bigelow, Parry, Thurber.*

Artemisia Californica, *Less. in Linnæa,* 6, *p.* 523. San Diego and San Luis Rey, California, where it abounds exceedingly; *Parry, etc.*

Artemisia dracunculoides, *Pursh; Gray, Pl. Wright. l. c.* Hills at the Cobre, New Mexico; *Wright, Bigelow.* On the Pecos, Texas; *Thurber.*

Artemisia Canadensis, *Michx.; Torr. & Gray, Fl.* 2, *p.* 417. With the last.

Artemisia filifolia, *Torr.; Torr. & Gray, l. c.; Torr. in Marcy Rep. t.* 12. Common in bottom land, from below El Paso to the Cobre, etc.

Artemisia Ludoviciana, *Nutt.; Torr. & Gray, l. c.* Very common, and in various forms; including A. Douglasiana and A. Mexicana.

Gnaphalium Californicum, *DC. Prodr.* 6, *p.* 224. San Diego, California; *Thurber.*

Gnaphalium luteo-album, *Linn.* Sandy low places, from the Nueces and Rio Grande, Texas to Sonora.

Gnaphalium Sprengelii, *Hook. & Arn.; Gray, Pl. Wright.* 1, *p.* 124, *&* 2, *p.* 99. Hills, etc., from the Limpio, Cobre, etc., to Sonora and California.

Gnaphalium leucocephalum, *Gray, Pl. Wright.* 2, *p.* 99. Bed of mountain torrents, near Santa Cruz, Sonora; *Wright, Thurber.*

Gnaphalium microcephalum, *Nutt.? Gray, Pl. Wright. l. c.* Cobre, New Mexico; *Wright.*

Gnaphalium palustre, *Nutt.; Torr. & Gray,* 2, *p.* 427. California; *Rev. Mr. Fitch,* etc. On the Colorado of the West; *Schott.*

Antennaria dioica, *Gærtn.* Cobre, New Mexico; *Bigelow.*

Filago Californica, *Nutt.; Torr. & Gray, l. c.* San Isabel, California; *Thurber.* On the Sacramento; *Rev. Mr. Fitch.*

Crocidium multicaule, *Hook. Fl. Bor.-Amer.* 1, *t.* 118. On the upper Sacramento, California; *Dr. Stillman.*

Arnica discoidea, *Benth. Pl. Hartw. p.* 319. Monterey, California, in woods and ravines; May; *Parry.* A form with even the upper leaves all opposite or nearly so.

Bartlettia scaposa, *Gray, Pl. Thurber, p.* 323. On a prairie near Corralitas, Chihuahua; August; *Thurber.*

Psathyrotes annua, *Gray, Pl. Wright.* 2, *p.* 100, *& Pl. Thurber, p.* 323. Bulbostylis (Psathyrotes) annua, *Nutt. Pl. Gambell.* Tetradymia (Polydymia) ramosissima, *Torr. in Emory, Rep. p.* 145. Colorado desert, California; *Schott.* Big-horn mountain, on the Gila; *Thurber.* "Flowers bright yellow. Foliage aromatic."

Psathyrotes scaposa, *Gray, Pl. Wright.* 2 *p.* 100, *t.* 13. Gravelly hills near El Paso, and Santa Maria, Chihuahua; *Wright, Bigelow.* Kioway crossing of the Rio Grande, near the Chisos mountains; *Parry.*

Haplöesthes Greggii, *Gray, Pl. Fendl. p.* 109. Along the Rio Grande below El Paso; *Parry,* *Bigelow.* The accessory nerves are wanting in the disk-corollas of Dr. Bigelow's specimens, and the rays are narrower and entire, not three-toothed as in Gregg's.

SENECIO MULTILOBATUS, *Torr. & Gray, in Pl. Fendl. p.* 109. Monterey, California, May; *Parry.*

SENECIO CORONOPUS, *Nutt.; Torr. & Gray, Fl.* 2, *p.* 437. San Luis Rey, February, on dry hill sides; *Parry.*

SENECIO TAMPICANUS, *DC. Prodr.* 6, *p.* 427. On the Limpio, Smith's Run, Rock Creek, White Rock Mountains, near the Rio Grande, etc.; *Bigelow, Wright, Parry.*

SENECIO LOBATUS, *Pers.* Low banks or beds of rivers, from Laredo to Frontera and the Santa Maria in Chihuahua.

SENECIO RIDDELLII, *Torr. & Gray, Fl.* 2, *p.* 444. On the Lower Rio Grande; *Schott.*

SENECIO LONGILOBUS, *Benth. Pl. Hartw. p.* 18. Gravelly hills, Arroyas, etc., on the Rio Grande above Presidio, to Chihuahua and Sonora. In very various forms.

SENECIO FILIFOLIUS, *Nutt.; Torr. & Gray, l. c.* On the Leona and Nueces, Texas.

SENECIO AUREUS, *Linn.*, var. BOREALIS, *Torr. & Gray, l. c.* Organ Mountains; *Wright, etc.*

SENECIO CANUS, *Hook.*, var. PYGMÆA, foliis angustissimis. Cobre, on mountains and hill sides; *Thurber, Bigelow.*

SENECIO FASTIGIATUS, *Nutt.; Gray, Pl. Wright.* 2, *p.* 99. Cobre, Mimbres, etc., New Mexico; *Wright, Bigelow, etc.*

SENECIO PARRYI (sp. nov.): herbaceus, viscoso-pubescens; caule striato; ramis oligocephalis; foliis argute inæqualiter dentatis, caulinis spathulatis inferne longe attenuatis basi dilatata auriculato-amplexantibus, ramealibus summis lanceolatis; bracteis setaceo-subulatis; capitulis breviter pedunculatis; involucri (semipollicari) paucibracteolati squamis acuminatis; ligulis 12–15; acheniis sericeo-cinereis —In live-oak groves, 150 miles above the mouth of the Pecos, on the Mexican side of the Rio Grande, November; *Parry.* Root not seen. Stem, etc., slightly floccose when young. Cauline leaves 2 inches or more in length. Ligules oblong, yellow, half an inch long.

CACALIA DECOMPOSITA, *Gray, Pl. Wright.* 2, *p.* 99. Mountains east of Santa Cruz, Sonora; *Wright.*

CENTAUREA AMERICANA, *Nutt.* Sandy soil etc. from the Lower Rio Grande to Chihuahua. C. Mexicana, *DC.*, is the same thing.

CIRSIUM WRIGHTII, *Gray, Pl. Wright.* 2, *p.* 101. Around springs, San Bernardino, New Mexico; *Wright.* Comanche springs; *Bigelow.*

CIRSIUM VIRGINIANUM, *Michx.* var. Low grounds, Escondido springs; *Wright.* Rio Grande; *Schott, etc.*

CIRSIUM UNDULATUM, *Nutt; Gray, Pl. Wright. l. c.* W. Texas to the Limpio, and to Sonora, etc. In various forms, probably including C. ochrocentrum, *Gray, Pl. Fendl. p.* 110, *& Pl., Wright,* 2, *p.* 101.

CIRSIUM NEO-MEXICANUM, *Gray, Pl. Wright.* 2, *p.* 101. Organ mountains and Cobre, New Mexico; *Wright, Bigelow.* Cooke's spring; *Thurber.*

CIRSIUM GRAHAMII, *Gray, Pl. Wright.* 2, *p.* 102. In swamps, between the Sonoita and San Pedro, Sonora; *Wright, Thurber.*

CIRSIUM COULTERI, *Harv. & Gray, Pl. Fendl. p.* 110? Monterey, California; *Parry.*

MOQUINIA HYPOLEUCA, *DC. Prodr.* 7, *p.* 22. Mountain pass, near Parras, *Thurber.* This is No. 1391 and 2358 of Berlandier's collection, who records its vernacular name as "Ocotillo."

TRIXIS FRUTESCENS, *P. Browne; DC. Prodr.* 7, *p.* 68; var. angustifolia, et foliis sericeo-pubescentibus, argute denticulatis; involucri superne sensim attenuatis acutis.—Among rocks, Bachimba, Chihuahua; *Thurber.* Ringgold's Barrack, on the Rio Grande, Texas; *Schott.* Var. angustifolia; foliis lato vel angusto-lanceolatis margine plerumque revolutis subsericeis sæpius integerrimis. T. angustifolia, *Gray, Pl. Wright.* 1, *p.* 128, *&* 2, *p.* 102. Ravines, Santa Cruz, Sonora; El Paso and Flounce mountains, New Mexico; *Wright, Parry, Bigelow.* Schultz, Bip. (in *Botany of the Herald, p.* 314) refers these all to T. frutescens, which may well be the case if that species includes forms with thickish and silky pubescent leaves as well as tapering acute scales of the involucre; but, on the other hand these narrow-leaved varieties quite as clearly run into T. angustifolia, *DC.* (Berlandier's No. 1284 and 1353,) which Schultz keeps separate. The latter belong to an arid region, and certainly look widely different from Berlandier's No. 2100 and 2230, which I had supposed to answer to the type of T. frutescens.

Perezia Thurberi, *Gray, Pl. Thurber, p.* 324. Rocky hills, near Santa Cruz, Sonora; *Thurber.* Dr. Schultz has recently referred Perezia to Trixis, perhaps with reason, as it is difficult to draw a limit between them.

Perezia Wrightii, *Gray, Pl. Wright.* 1, *p.* 127. On the Rio Grande, Rio Frio, Limpio, etc.; *Wright, Bigelow, Parry, Schott, Thurber.*

Perezia nana, *Gray, Pl. Fendl. p.* 111, *& Pl. Wright. l. c.* Gavelly or rocky hills, from the Rio Grande, Texas, to the San Pedro, Sonora. The name is not always appropriate, as the plant is sometimes a foot high.

Perezia runcinata, *Gray, l. c.* From the lower Rio Grande to Chihuahua. The fascicled roots become tuberous-thickened below, like those of a Peony or Dahlia.[*]

Leria nutans, *DC.* Western and southern Texas, to the Rio Grande.

Calais linearifolia, *DC. Prodr.* 7, *p.* 85; *Gray, Pl. Wright.* 2, *p.* 102. Near San Diego, California; *Parry.* New Mexico on the Rio Grande, Organ mountains, and Lake Gusman; *Wright, Bigelow.* Guadalupe cañon, Sonora; *Capt. Smith.*

Calais Parryi, (*Gray, in Bot. Whippl. Rep. p.* 112, *adn.*): scaposa, fere glabra; foliis lineari-lanceolatis sæpius pinnatifido-laciniatis; involucri squamis triseriatis ovatis oblongisve subobtusis, exterioribus gradatim brevioribus; ovariis lævibus; pappi paleis oblongis apice bifidis arista e sinu exserente barbellato-scabra dimidio brevioribus.—Near San Diego, California; March; *Parry.* The specimens are too young to give the complete characters. The plant belongs to the section *Calocalais*, and in the pappus most resembles C. macrochæta, *Gray, Pl. Fendl.*; but the scales of the involucre are much broader and blunt, and the awn of the pappus is shorter and more denticulate; the leaves also are shorter and mostly obtuse. In C. macrochæta, the scales of the involucre are lanceolate and gradually very taper-pointed; and the slender awn is scarcely scabrous.

Calais Douglasii, *DC. Prodr.* 7, *p.* 85. Near San Diego, California, March; *Parry.* Very small and imperfect specimens. Exterior achenia hirsute, as stated by Nuttall, not the inner, as described by Hooker and Arnott.

---

[*] In Berlandier's *reliquiæ* I find still another Perezia viz:

Perezia thyrsoidea (sp. nov.): glanduloso-scabrida; ramis floridis strictis; foliis confertis subimbricatis oblongis ovatisve utrinque angustatis pungenti-acutis basi sessili vix aut ne vix amplexicaulibus rigidis spinuloso-serrulatis reticulatis subtus præsertim glanduloso-puberulis; ramulis 3–5-cephalis brevibus folia parva integerrima bracteiformia gerentibus in thyrsum elongatum spiciforme congestis; involucro cylindrico 10–12-floro; squamis lineari-lanceolatis sensim subulato-acuminatis appressis, intimis pappo rigidulo copioso (haud clavellato) æquilongis.—Guanaxuato, Mexico, No. 1329. Base of the stem not seen, nor the leaves much below those which bear flowering branchlets in their axils. Lowest leaves seen 2½ inches long, gradually decreasing to an inch, and shorter than the flowering branchlets they subtend; these altogether form a dense and elongated thyrsus of a foot or so in length. Heads 9 or 10 lines long Scales of the involucre glandular, imbricated in several series, the exterior passing into bractlets. Pappus whitish, pluriserial. This can hardly be the Perezia moschata of Lallav. and Lex, or any other described species.

CALAIS PLATYCARPHA (*Gray, in Bot., Whippl. Rep. p.* 113 & 114,): scaposa; foliis pinnatipartitis (vel integris?) glabris; involucro calyculato; acheniis immaturis brevibus truncatis, paucis extimis villosis; pappi paleis orbiculatis seu latissime ovalibus integerrimis apice subito brevi-aristatis.—On clay hills, San Luis Rey, California; *Parry*. The specimen, although too young, affords characters which well distinguish this from the cognate C. Douglasii. The leaves are cut into numerous short and crowded lobes, and are as long as the young scapes. Involucre only 4 lines long, consisting of 8 or 10 oblong and rather obtuse scales of equal length, and of a few short calyculate scales. The young achenia are oblong, rather clavate, and largest at the truncate apex; it is not likely that they become rostrate or even tapering at the apex. Some of the exterior ones are hairy, more so than in C. Douglasii; the others are glabrous, except a minute papillose pubescence on the ribs. Paleæ of the pappus 5, nearly 3 lines long, fully 2 lines wide, entire, the midrib abruptly exserted into a scabrous awn of only one-third the length of the scale itself.

HEMIPTILIUM, Nov. Gen.

Capitula et habitus Stephanomeriæ. Achenia angulata, utrinque truncata, costata, costis 5—10 tuberculatis. Pappus 5–15-paleatus; paleis lineari-lanceolatis vel setiformibus inferne nudis, apicem versus breviter plumosis.—Herbæ graciles, annuæ vel biennes, glabræ, paniculato-ramosissimæ; ramis fere aphyllis; floribus roseis? Species 2, nempe:

HEMPITILIUM SCHOTTII (sp. nov.): capitulis parvis 5-floris; acheniis 5–6-angulatis pluricostatis, costis tuberculoso-scabris; pappi paleis 5–6 rigidis lineari-lanceolatis obtusiusculis achenio haud longioribus infra medium nudis marginibus leviter scariosis.—Camp Miller, valley of the Gila; May, 1855; *Schott*. Only branchlets or branches were collected; these bear merely small subulate bracts in place of leaves, and racemose-panicled small heads. Involucre only 3 lines long. Branches of the style clavate, glabrous. Color of the flowers not recorded. Achenia 1½ line long: pappus of rigid paleæ, persistent or nearly so; the plumose hairs borne at the upper part not much longer than the breadth of the palea. The plant resembles Stephanomeria paniculata in aspect.

HEMIPTILIUM BIGELOVII (sp. nov.): caule paniculato-ramosissimo e radice annua seu bienni; foliis radicalibus linearibus subpinnatifidis, rameis vix ullis; capitulis 6–9-floris; acheniis 5-costatis, costis validis rugoso-tuberculatis; pappo achenio duplo longiore e setis fragilibus 12–15 basi dilatatis rariter denticulatis vel setulosis medio gracillimis nudis versus apicem barbellato-plumosis.—Frontera, New Mexico; *Bigelow*. Plant with the aspect of Stephanomeria minor, (with which it has probably been confounded,) but perhaps more upright. Involucre 4 or 5 lines long; the ligules exserted to about the same length, apparently white or rose-color. Achenia with thick corky ribs, or strong angles. Pappus white, fragile, at the summit appearing like that of a Stephanomeria, although rather less plumose, but naked below, and paleaceous at the base.

STEPHANOMERIA MINOR, *Nutt.; Gray, in Whippl. Rep. p.* 114. S. minor & S. runcinata, *Nutt.; Gray, Pl. Wright.* etc. Gravelly and rocky soil, from the Pecos, western Texas, to the Colorado of the West.

STEPHANOMERIA THURBERI, *Gray, Pl. Thurber, p.* 325. Sierra de los Animos, Sonora; *Thurber*. On the Santa Cruz river; *Captain Smith*. Near the Cobre and Mimbres, New Mexico; *Bigelow*, *Dr. Henry.* Heads large, 17–20-flowered, with pink and fragrant flowers. Bristles of the pappus 25–30.

Rafinesquia Neo-Mexicana, *Gray, Pl. Wright.* 2, *p.* 2, *& p.* 103. Gravelly hills near El Paso, etc., New Mexico; *Bigelow, Wright, Parry.* Cook's Spring; *Bigelow.*

Rafinesquia Californica, *Nutt. in Trans. Amer. Phil. Soc.* 7, *p.* 429. (Tab. XXXIV.) Oak groves, Monterey, California; *Parry.* Found also by Frémont on the Mohave river and in other parts of California. Some of the mature achenia (usually the exterior ones) have a mottled appearance, as represented in one of the figures.

Calycoseris Parryi (sp. nov.): involucro polyphyllo subimbricato; floribus flavis; acheniis longe rostratis, costis lævibus acute trinervatis.—Mountains east of Monterey, California; June; *Parry.* Only a single specimen was gathered, and that consists merely of the upper part of the plant, with reduced foliage. It is most interesting, however, as adding a second species to the genus Calycoseris, being a strict congener of the New Mexican C. Wrightii. It is distinguished by its yellow flowers, rather larger heads, more numerous scales to the involucre, of which there are likewise a few external and shorter scales, effecting a transition into the smaller calyculate ones, which are more pointed and mostly squarrose-recurved; the scales, as well as the peduncles and branchlets, are more conspicuously beset with similar setose-pedicellate glands, which here are blackish. More important characters are afforded by the achenia; these are more slender and rather longer; the strong ribs are not so thick, and are smooth or even, (while in C. Wrightii they are tuberculate-roughened, a character by no means sufficiently represented in the plate,) each with a sharp and salient dorsal nerve or keel, and with a less conspicuous lateral one on each side; and the slender beak is as long as the body of the achenium.

Calycoseris Wrightii, *Gray, Pl. Wright.* 2, *p.* 104, *t.* 14. Low hills and alluvial banks of the Rio Grande, and elsewhere in New Mexico; gathered by all the collectors. Guadalupe cañon, Sonora; *Capt. Smith.*

Pinaropappus roseus, *Less.* Not rare in western and southern Texas, in Sonora, etc.

Malacothrix Californica, *DC. Prodr.* 1, *p.* 192. In rather dry grassy places, Monterey, California; *Parry.*

Malacothrix? Coulteri, *Harv. & Gray, Pl. Fendl. p.* 113, *adn.* On the Sacramento? California; *Rev. Mr. Fitch.* One or two small bunches merely, throwing no more light upon this plant.

Malacothrix obtusa, *Benth. Pl. Hartw. p.* 321. Monterey, California; *Parry.*

Malicothrix tenuifolia, *Nutt. in Trans. Amer. Phil. Soc. n. ser.* 1, *p.* 435, ex char. Valley of the Gila, at Camp Miller; May, 1855; *Schott.* The same as Coulter's No 246, and apparently Nuttall's plant. But it is herbaceous, except perhaps the very base, and the nascent shoots and young involucral scales are canescent with a stellate tomentum, which is soon deciduous. From three to five of the bristles of the pappus are more persistent and naked.

Malacothrix Fendleri, *Gray, Pl. Wright.* 2, *p.* 104. Along the Rio Grande, at El Paso, and elsewhere; *Bigelow, Wright,* etc. Guadalupe cañon, Sonora; *Capt. E. K. Smith.*

Pyrropappus Carolinianus, *DC. Prodr.* 7, *p.* 44. From the lower Rio Grande, Texas, to the Santa Cruz river, Sonora; *Schott, Capt. Smith.*

Macrorhynchus heterophyllus, *Nutt.; Gray in Whippl. Rep. p.* 115. M. Californicus, *Torr. & Gray.* (Cryptopleura Californica, *Nutt.*) M. Chilensis, *Hook. & Arn.* Monterey and elsewhere in California; *Parry,* etc.

Macrorhynchus Lessingii, *Hook. & Arn. Bot. Beech. p.* 361. Sea-beach at Monterey, California; April; *Parry.* The specimen is in too early a state for proper investigation, but it has a thick root, and very obtuse or rounded exterior scales of the involucre. Perhaps M. grandiflorus, *Nutt.* (which is known only in fruit) is a fully developed state of it.

Prenanthes? exigua, *Gray, Pl. Wright.* 2, *p.* 105. Hills near El Paso, etc.; *Wright, Bigelow.*

Lygodesmia aphylla, *DC.*, var. Texana, *Torr. & Gray, Fl.* 2, *p.* 485. Common on plains from San Antonio, Texas, nearly to the Rio Grande, New Mexico. The stems bear long leaves towards the base.

Mulgedinum pulchellum, *Nutt.; Torr. & Gray, l. c.* Plains, from the Limpio to the Rio Grande, and Cobre, New Mexico.

Sonchus oleraceus, *Linn.* Alluvial borders of the Rio Grande; *Schott, Bigelow.*

Sonchus asper, *Vill.* Along the Gila; *Schott.* Cobre, New Mexico; *Bigelow.*

Crepis ambigua, *Gray, Pl. Fendl. p.* 114, & *Pl. Wright.* 2, *p.* 106. Organ mountains, New Mexico; *Wright.*

Hieracium longipilum, *Torr.*; *Torr. & Gray, Fl.* 2, *p.* 477. White-Rock mountain, head of Rock creek, western Texas; *Bigelow;* July.

LOBELIACEÆ.

Lobelia pectinata, *Engelm. in Wisliz. Rep. p.* 108. L. fenestralis, *Cav.?* Sonora, September; *Thurber*, *Schott.* (No. 420 and 1430, *Wright.*) The plant of Cavanilles is said to be perennial, while ours is certainly annual.

Lobelia Berlandieri, *Alph. DC. Prodr.* 7, *p.* 367. On the lower Rio Grande, Chihuahua, Neuvo Leon, etc. (No. 419 and 1429, *Wright.* No. 3177, *Berlandier*, Matamoras.) Annual, smooth. Stem erect, or sometimes apparently prostrate, more or less branching, mostly naked above. Lowest leaves broadly ovate or obovate, tapering at the base into a petiole; upper ones sessile, ovate and oblong-lanceolate, irregularly and acutely toothed. Flowers in lax racemes terminating the branches; the pedicels 2–4 lines long and twice the length of the linear bracts. Calyx about two thirds as long as the tube of the corolla, the segments subulate and denticulate. Corolla blue, 3–4 lines long; upper segments oblong-lanceolate; lower ones much narrower; the tube about as long as the stamina. Wright's 419 and 1429, differ in being more leafy above, and in the shorter pedicels. We suspect they are all forms of L. Cliffortiana.

Lobelia puberula, *Michx. Fl.* 2, *p.* 152. Near Victoria, Texas. This is the same as No. 42 of Drummond's 3d Texan collection, which Alph. DC, refers to L. amœna.

Lobelia laxiflora, *H. B. K.* 3, *p.* 311. L. fissa, *Roem. & Schultes.* Mabibi, Sonora; June; *Thurber.* About a foot and a half high. Leaves 3–5 inches long, lanceolate, acute at each end; the lower ones remotely and obscurely denticulate; the upper minutely and sharply serrulate. Raceme few-flowered. Pedicels an inch or more in length. Flowers nearly as large as in L. cardinalis. Segments of the calyx triangular-lanceolate, scarcely longer than the hemispherical tube. Corolla dull red; the tube three times as long as the calyx. Stamineal column considerably exserted.

Lobelia cardinalis, *L. Sp. p.* 1320. L. Texensis, *Raf.* Leon Spring, Devil's river, and Head of the Nueces, western Texas; also on the Mimbres, Neuvo Mexico; *Bigelow.* The flowers are sometimes smaller than in the northern plant; in which state it seems to be hardly distinct from L. Texensis, *Raf.*, except in the narrower flowers, and usually shorter sepals.

Nemacladus ramosissimus, *Nutt. in Trans. Amer. Phil. Soc. n. ser.* 8. *p.* 254. (Tab. XLV.) Hill sides, Frontera, on the upper Rio Grande; also in Chihuahua, and near the Pimos villages, on the Gila; *Parry.* (No. 1428 and 1431, *Wright.*) We have specimens from California, collected by Dr. *Andrews* and *Rev. Mr. Fitch.* Mr. Nuttall considers this remarkable plant as the type of a distinct natural order which ought to be placed between Lobeliaceæ and Goodenoviaceæ; but we think it should certainly be referred to the former, notwithstanding the non-cohering anthers. The stigma is destitute of an indusium, and even of a hairy fringe.

CAMPANULACEÆ.

Dysmicodon perfoliatum, *Nutt. l. c.* Campanula perfoliata, *Linn.* Copper Mines and Rio Mimbres, New Mexico; April–June; *Bigelow.* Cañon of Guadalupe, Sonora; *Capt. E. K. Smith.*

Dysmicodon ovatum, *Nutt. l. c.* On the lower Rio Grande; April; *Schott.* Bexar, Texas; *Berlandier*, No. 368.

Campylocera leptocarpa, *Nutt., l. c.* First crossing of the Rio San Pedro, Texas; May–June; *Bigelow.*

Campanula rotundifolia, *Linn. Sp. p.* 239. Rocks on the Rio Grande, 150 miles above the mouth of the Pecos; November; *Parry.* The radical leaves are ovate and acute, but there can be little doubt of the plant being a form of C. rotundifolia.

ERICACEÆ.

Arctostaphylos pungens, *H. B. K. Nov. Gen. & Sp.* 3, *p.* 278; *Torr. in Emory, Rep. t.* 7, *& in Bot. Whipp. Rep., p.* 116. Dry pine woods, near Monterey, in the same State; *Parry.* Mountain sides and dry ravines, San Luis, etc., Sonora; *Capt. E. K. Smith; Schott, Thurber.* Mexico; *Berlandier*, No. 1318. Sometimes procumbent. Flowers rose-color.

Arctostaphylos tomentosa, *Dougl.; DC. Prodr.* 7, *p.* 585; *Torr. l. c.* San Luis Obispo, California; April; *Parry.* Also in Napa county; *Thurber.* It is called *Mansinita*, (little apple,) by the Mexicans of California. The red berries are used by the Spanish natives to make a cooling sub-acid drink.

Arctostaphylos polifolia, *H. B. K. Nov. Gen., & Sp.* 3, *p.* 277. Lower California, near the boundary line. A shrub, about six feet high, with dark purple berries, which become black in drying.

Arbutus Menziesii, *Pursh, Fl.* 1, *p.* 282. Mountains at the head of Rock creek; *Bigelow.* (No. 1433, *Wright.*) Only 12–15 feet high, and with smaller leaves than in the Oregon and California plant. In California, where it is common, it is a most beautiful tree, often 40 feet or more in height, and is known by the name of Madronia. The wood is used for making the heavy wooden stirrups of the Mexicans.

Gaultheria Shallon, *Pursh, Fl.* 1, *p.* 284, *t.* 12. Pine woods near Monterey and in other parts of California; *Parry.* The aromatic acid berries are rather agreeable to the taste.

Vaccinium ovatum, *Pursh, Fl.* 1, *p.* 290; *Lindl. Bot. Reg. t.* 1354. Pine woods near Monterey, California; *Parry.* A neat evergreen shrub, 2–3 feet high. The berries are edible, but small.

STYRACEÆ.

Styrax Californicum, *Torr. Pl. Frém. in Smithson. Contrib. vol.* 6. Valley of the Sacramento.

EBENACEÆ.

Diospyros Texana, *Scheele in Linnæa.* 22, *p.* 145. Hill sides, Fort Inge to Escondido creek, and near Eagle Pass, western Texas; *Schott, Parry.* Flowers in March. Fruit ripe in August, about an inch in diameter.

SAPOTACEÆ.

Bumelia reclinata, *Vent. Ch. Pl. t.* 22, *fide Alph. DC. Prodr.* 8, *p.* 190: var. fructibus majoribus; floribus fasciculis numerosioribus. On the Rio Grande, from Laredo to the mouth of the river; *Schott.* Hills and plains near Live Oak creek; *Bigelow.* No. 1434, *Wright.* Matamoras; *Berlandier,* Nos. 1513, 3012 and 3048. A tree 25–30 feet high. It seems to differ from the plant of the Southern Atlantic States chiefly in the larger and more fleshy fruit. This is oblong, nearly three-fourths of an inch in length, sweet and edible. Testa smooth and shining, mottled with brown. Cotyledons united, thick and fleshy. Albumen wholly wanting.

THEOPHRASTACEÆ.

Jacquinia pungens, *Gray, Pl. Thurb. in Mem. Amer. Acad. Art. & Sc. n. ser.* 5, *p.* 325. Hills between Rayon and Ures, Sonora; *Thurber.* Perhaps a variety of T. macrocarpa, *Cav.*

PLANTAGINACEÆ.

Plantago major, *Linn. Sp., p.* 163. Banks of the Acequia, near El Paso; May; *Bigelow.* (No. 1441, *Wright.*) Probably introduced among agricultural seeds by the early Mexican settlers.

Plantago Patagonica, var. gnaphalioides, *Gray in Torr. Bot. Whipp. Rep. p.* 117, *& Man. Bot. ed.* 2, *p.* 269. P. gnaphalioides, *Nutt. Gen.* 1, *p.* 100. Western Texas, New Mexico, Sonora and California. Var. spicis oblongis vel capitatis. Dry hills, Sonora; *Schott.* San Diego, California; *Parry.* (No. 1438, *Wright.*)

Plantago Virginica, *Linn. Sp., p.* 163. Sandy banks of the Rio Grande, Eagle Pass, etc. Also in Sonora; *Schott.*

PLUMBAGINACEÆ.

Statice Limonium, *Linn. Sp., p.* 394. Saline soils, western Texas, and on the Rio Grande near its mouth; *Bigelow, Schott.* Salt places near San Diego, California; *Parry.*

PRIMULACEÆ.

Androsace occidentalis, *Pursh, Fl.* 1, *p.* 137; *Nutt. Gen.* 1, *p.* 118. Mule Spring and Cook's Spring, western Texas; April; *Bigelow.* Tubac, Sonora; March; *Parry.*

Samolus Valerandi, *Linn.,* var. Americanus, *Gray Man. ed.* 2, *p.* 274. S. floribundus, *H. B. K. Nov. Gen. & Sp.* 2, *p.* 224. Low places, borders of the Limpio; July, *Bigelow.* Banks of streams, Sonora, May; *Capt. E. K. Smith.* California; *Parry.*

Samolus ebracteatus, *H.. B. K., l. c. p.* 223, *t.* 129. Common along the Rio Grande from El Paso to the Gulf, and on the seacoast of Texas.

Dodecatheon Meadia, *Linn. Sp. p.* 207; *Torr. in Bot. Whippl. Rep., p.* 118. Grassy places near Monterey and other places in California; March to April; *Parry.* This includes D. integrifolium, *Michx.*, and even D. frigidum, *Cham.*

LENTIBULACEÆ.

Utricularia gibba, *Linn. Sp. p.* 26. In the San Pedro river, also in Elm creek, and near the head waters of the Nueces, western Texas, October; *Bigelow.*

BIGNONIACEÆ.

Tecoma stans, *Juss. Gen. p.* 139; *DC. Prodr.* 9, *p.* 225. Hills along the Rio Grande, from El Paso downward and westward to Sonora; May to July. (No. 1446, *Wright.*)

Chilopsis linearis, *DC. l. c. p.* 227. C. glutinosa, *Engelm. in Wilz. North. Mex., p.* 94. Hills and ravines along the Rio Grande, Santa Cruz river, etc., Sonora; *Schott* and *Capt. E. K. Smith.* San Felipe, California; *Parry* (No. 1447, *Wright*). A shrub usually 4–6 feet high, but Capt. Smith saw it in Sonora 25 feet high. I can distinguish but one species in the collections.

Suborder SESAMEÆ.

Martynia violacea, *Engelm. in Wisliz. l. c. p.* 101. Low places and plains, near the Limpio, etc.; July; *Bigelow.* Near Laredo; *Schott.* Corallitas, etc., Chihuahua; *Thurber, Parry.*

Martynia arenaria, *Engelm. l. c. p.* 100. Sandy places, from El Paso and near the Limpio (*Bigelow*) to the Presidio del Norte; July; *Parry.* Sonora; September; *Thurber.* "Plant viscid; corolla reddish-yellow externally, yellow inside; the throat mottled and veined with brown." *Thurber.*

OROBANCHACEÆ.

Aphyllon uniflorum, *Torr. & Gr. in Gray's Man. Bot. ed.* 2, *p.* 281. Orobanche uniflora, *Linn.* California; *Rev. A. Fitch.*

Aphyllon fasciculatum, *Torr. & Gr. l. c.* Orobanche fasciculata, *Nutt. Gen.* 2, *p.* 59; *Hook. Fl. Bor.-Am.* 2, *p.* 93, *t.* 170. Tributaries of the Rio Yaqui, Sonora; June; *Thurber.* Mountains east of San Diego; June; *Parry.* Our numerous specimens show that the divisions of the calyx are variable in length and shape, so that the species is chiefly distinguished by its scaly stem and shorter peduncles.

Phelipæa Ludoviciana, *Walp.; Reuter in DC. Prodr.* 11, *p.* 11. Orobanche Ludoviciana, *Nutt.* On the beach at Brazos Santiago, Texas; May; *Schott.* Pachitiga, Chihuahua; August; *Thurber.*

Phelipæa comosa. Anoplanthus comosus, *Walp. Rep.* 3, *p.* 480, *& Reut. l. c.* Orobanche comosa, *Hook. Fl. Bor.-Am.* 2, *p.* 92, *t.* 169. California, probably on the lower Sacramento; *Shelton.* The specimens were parasitic on the roots of a species of Grindelia; apparently G. arguta. The calyx is deeply 5-parted, with nearly equal lanceolate-subulate segments. Bracteoles very remote from the flower, alternate on the pedicel, resembling the segments of the calyx. Lobes of the corolla all acute and entire; those of the upper lip ovate-lanceolate; of the lower linear-lanceolate.

SCROPHULARIACEÆ (by A. Gray).

Maurandia antirrhiniflora, *Willd. Hort. Berol. t.* 83. Common in the valley of the Rio Grande, and west to California.

MAURANDIA (EPIXIPHIUM) WISLIZENI (sp. nov. *Engelm.*): scandens, glabra; foliis hastatis; pedicellis axillaribus petiolo sæpiusque calyce brevioribus; corolla "pallide cærula," fauce pervia nuda; calyce fructifero demum subcoriaceo valde aucto et reticulato basi 5-angulato seu 5-carinato, lobis triangulari-lanceolatis sensim acuminatis; capsula ovoidea coriacea calyce inclusa stylo ensiformi rigido persistente cornuta, loculis juxta apicem rima transversali dehiscentibus; seminibus compressis ovalibus alatis disco paleaceo-rugosis.—Along the Rio Grande below Doña Ana, etc. This was first received in the collection of Dr. Wislizenus, and afterwards in that of Wright and most others from the northern borders of Mexico. Dr. Engelmann proposed it long ago, in MSS., as a new genus, under the name of *Epixiphium maurandioides*, which is here, with his permission, changed to Wislizeni, since I incline to view the plant as the type of a mere subgenus of Maurandia, freely admitting, however, that its characters are as well marked as those of Lophospermum. The remarkable fructiferous calyx is 8 or 9 lines broad at the base, strongly 5-angled and keeled, and an inch or an inch and a half long; the sword-shaped persistent style nearly equals the calyx-lobes, and the dehiscence is by a clean transverse chink on each side, which inclines to extend downwards so as to become valvular. Seeds blackish, distinctly winged, 1½ to 2 lines long.

ANTIRRHINUM NUTTALLIANUM, *Benth. in DC. Prodr.* 10, *p.* 592. San Diego, California; May–June; *Parry.* On the Great Colorado; *Schott.* Leaves of the branches mostly roundish-cordate. Segments of the calyx ovate, a little unequal. Persistent base of the style oblique.

ANTIRRHINUM COULTERIANUM, *Benth. l. c.* Near San Pasqual, California, May; *Thurber.* Mountains east of San Diego, June; *Parry.* Root annual. Stem 3 or 4 feet high, supporting itself on other plants by its twining slender branches. Raceme nearly a foot long: persistent base of the style oblique. This species is near A. majus.

LINARIA CANADENSIS, *Dum.; Benth. in DC. Prodr.* 10, *p.* 278. Near the Copper Mines, and on Rock creek, New Mexico; *Bigelow.* Monterey, California; *Parry.* Upper Sacramento; *Stillman.*

SCROPHULARIA COCCINEA (sp. nov.): glabra; foliis deltoideo-ovatis vel subcordatis acutis grosse dentatis, dentibus pauci-serratis; thyrso oblongo aphyllo; cymis plurifloris floribusque minutim glandulosis; calycis segmentis ovatis margine haud scariosis; corolla læte coccinea, lobis 2 posticis tubo ovato-oblongo gibboso dimidio breviore, anticis brevissimis; anthera sterili obovato.—At the base of a rocky ledge near the summit of a mountain, Santa Rita del Cobre, New Mexico; *Wright* (1470), *Bigelow.* What appears to be the same species in fruit was collected by Dr. Bigelow near the Organ mountains. A truly handsome species. Specimens raised from seeds in the autumn of 1852 (but which were unfortunately soon lost) displayed flowers as bright red as those of Stachys coccinea.

COLLINSIA BICOLOR, *Benth. in Hort. Trans. n. ser.* 1, *p.* 48, *& in DC. Prodr.* 10, *p.* 318. Oak woods near Santa Barbara, and San Diego, California; March; *Parry.*

PENTSTEMON AMBIGUUS, *Torr. in Ann. Lyc. N. Y. p.* 228, *& in Marcy's Rep. p.* 293, *t.* 16. Gravelly hill sides near Tascate; July; and Burro mountains; September; also near San Diego; *Bigelow.* Sand hills, Chihuahua; *Thurber* (742.) A common species in or near the southern Rocky mountains. In the figure cited above, the sterile filament is represented as bearing a small anther, to which no allusion is made in the letter-press. It is not found in the present specimens, but exists in all those collected by Captain Marcy. In this as in several species of the genus, either all four fertile stamens or the two posterior are often free from the corolla nearly or even quite to the base.

PENTSTEMON LINARIOIDES (sp. nov.): suffruticosus, pube minutissima glauco-cinereus, multicaulis; caulibus floridis simplicibus foliosis strictis (6–15-pollicaribus); foliis angustissime linearibus seu lineari-acerosis imisve spatulato-linearibus mucronatis integerrimis; racemo vel paniculo virgato laxifloro; pedunculis alternis brevibus 1–5-floris; calycis segmentis ovatis vel ovato-lanceolatis acuminatis inferne scarioso-marginatis; corolla pallide cæruleo-purpurea superne ampliata breviter bilabiata, palato pl. m. barbato, lobis rotundatis subconformibus patentibus; antheris glabris subexsertis; filamento sterili longitudinaliter barbato.—Organ mountains; *Parry.* Copper Mines and Los Animos, New Mexico; *Wright,* (1472,) *Thurber,* (331, 1115,) *Bigelow.* Sierra San Luis, Chihuahua and Sonora; *Schott.* A well marked species, of the group to which the preceding belongs; the numerous flowering stems form a woody base; the foliage and inflorescence resembling one of the strict and narrow-leaved Linarias. Corolla 7 to 9 lines long.

PENTSTEMON JAMESII (*Benth. in DC. Prodr.* 10, *p.* 325): pumilus, strictus, puberulus; foliis nunc glabratis omnibus sessilibus plerisque parce denticulatis, caulinis floralibusque linearibus, imis et radicalibus sublanceolatis deorsum attenuatis; racemo 8–12-floro spicato; pedunculis alternis 1–2-floris seu pedicellis brevissimis cum sepalis e basi lata lanceolatis sensim acuminatis viscido-pubentibus; corolla (pallide purpurea) tubo angusto, fauce subito valde ampliata campanulata, lobis conformibus rotundatis; antheris glabris; filamento sterili longitudinaliter barbato.—Low places near the Limpio, July; *Bigelow.* This species may be described as intermediate between P. Cobæa and P. pumilus, *Nutt.* The specimens are only 5 or 6 inches high, herbaceous, erect, leafy; the leaves from 1½ to 2½ inches long, and 1½ to 2½ lines wide, thickish; the upper floral linear-subulate and not exceeding the calyx; the latter is half an inch long; the corolla, which has just the shape of that of P. Cobæa, is over an inch long. It is somewhat viscid externally and slightly bearded within the lower lip. Sterile stamen like that of P. Cobæa, but the beard denser.

PENTSTEMON STENOPHYLLUS (sp. nov.): glaberrimus; caule gracili 2–3-pedali; foliis linearibus elongatis integerrimis, floralibus lineari-setaceis; panicula laxiflora; pedunculis oppositis patentibus gracilibus 2–5-floris pedicellis 2–4-plo longioribus; calyce parce glanduloso-pubero, segmentis ovatis margine scariosis ciliato-denticulatis acuminatis, acumine patente; corolla infundibuliformi-ampliata (fere sesquipollicari cærulea?) vix bilabiata, lobis brevibus conformibus rotundatis; antheris rima hirto-ciliolatis; filamento sterili glaberrimo summo apice dilatato.—Hills between Babacomori and Santa Cruz, Sonora; *Wright,* (1477.) Radical leaves not seen; cauline all alike, but gradually smaller and narrower towards the summit of the virgate stem, the larger 4 inches long and 1½ or 2 lines wide, perfectly entire. Peduncles 1½ or 2 inches long. Pedicels 3 to 6 lines long. Calyx 2 or 3 lines long. This species belongs to the section *Cepocosmus,* and to the same group with P. imberbis. If, as seems likely, No. 186 of the collection of Wislizenus, from Cosiquiriachi, belongs here, the corolla is blue.

PENTSTEMON DASYPHYLLUS (sp. nov.): velutino-puberulus; caulibus e basi suffructicosa strictis; foliis lineari-lanceolatis imisve oblanceolatis integerrimis obtusis junioribus præsertim molliter velutinis, floralibus gradatim minoribus cum racemo simplici laxo paucifloro glanduloso-puberulentis; pedicellis alternis; sepalis ovato-oblongis obtusis; corolla ("purpureo-cærulea" fere sesquipollicari) ampliato-infundibuliformi vix bilabiata, lobis rotundatis subconformibus; antheris rima ciliolato-hirtellis; filamento sterili glaberrimo apice vix dilatato.—Stony hills of the Pecos, and Cook's Spring, New Mexico; *Wright,* (1478). Valley of the Santa Cruz river on mountain sides, and in the valley of the San Pedro, Sonora; *Capt. E. K. Smith, Bigelow & Thurber.* Also collected by Dr. Woodhouse in Sitgreave's expedition. Stems 1 to 2 feet high, simple, virgate. Leaves 1 to 3 inches long, 1½ to 3 lines wide, thickish. Pedicels almost always simple and ebracteolate, 3–8 lines long. Calyx 2–3 lines long; corolla much as in the last; sterile filament shorter, and gradually very slightly dilated upwards. This is evidently most related to P. lanceolatus, *Benth.;* but is more downy, with simpler inflorescence; and the much larger and more dilated corolla is of a different color; being red in P. lanceolatus, according to Dr. Gregg's notes on a specimen gathered by him at Buena Vista.

PENTSTEMON VIRGATUS, (sp. nov.): glaber, seu minutissima glanduloso-puberulus; caule herbaceo simplici stricto; foliis lineari-lanceolatis acutis integerrimis, radicalibus spatulato-lanceolatis obtusis, floralibus gradatim in bracteas subulatas breves diminutis; panicula virgata elongata multiflora subsecunda; pedunculis plerumque oppositis 1–4-floris pedicellisque sæpissime floribus haud longioribus; sepalis ovato-rotundis margine subscariosis; corolla (roseo-lilacina venis intus purpureis) dilatato-infundibuliformi bilabiata, labiis æquilongis, superiore vix concavo bilobo, inferiore patente tripartito, lobis omnibus ovalibus conformibus; antheris glabris subexsertis; filamento sterili glaberrimo apice dilatato.—Santa Rita del Cobre, on the mountains; *Bigelow, Wright,* (1476;) also gathered by *Dr. Woodhouse.* A pretty species, which has been raised in the Cambridge Botanic Garden, from Mr. Wright's seeds. It is a foot or 18 inches high, including the virgate inflorescence of half that length. Leaves from 1½ to 4 inches long, and 1½ to 3 lines wide, usually tapering to both ends. Corolla two-thirds of an inch long. Anther-cells soon divaricate. According to Bentham's arrangement this belongs to the section Eupentstemon.

PENTSTEMON PUNICEUS (sp. nov.): glaberrimus, glaucus; caule herbaceo valido; foliis crassis, radicalibus obovatis, caulinis ovatis cordato-amplexicaulibus plus minusve connatis acutis integerrimis, floralibus parvis; panicula contracta virgata nuda interrupta; cymis subsessilibus multifloris; pedicellis gracilibus (flore fere æquilongis) nudis; sepalis ovalis obtusis; corolla infundibuliformi, limbo fere æqualiter 5-lobo, lobis rotundatis patentibus; antheris glabris, filamento sterili sub apice hinc barbato.—In the Guadalupe cañon, Sonora, June, 1851; *Thurber & Captain E. K. Smith.* This is apparently a large, and must be a strikingly handsome species, with its glaucous foliage and "brilliant scarlet" flowers. Lower leaves (with the base of the stem) wanting in my specimen; but those present show a tendency to be connate-perfoliate. Corolla less than an inch long; the throat moderately enlarged; lobes about 3 lines long.

PENTSTEMON PUNICEUS, var.? PARRYI: foliis superioribus (caet. ignotis) lanceolatis basi cordato-amplexicaulibus; cymis pedunculatis; floribus paullo minoribus; sepalis oblongis; filamento sterili sub apice hinc densissime barbato.—On the Rio Gila, March, 1852; *Parry* The specimens gathered are merely two flowering summits; the color of the blossoms not recorded, nor positively to be made out. But its floral characters so nearly accord with the preceding that it must, for the present at least, be appended to it.

PENTSTEMON WRIGHTII, *Hook. Bot. Mag., t.* 4601. On rocky mountain sides near the head of the Limpio, June; *Wright,* (unnumbered.) Santa Cruz mountains and Los Nogales; *Captain E. K. Smith.* (The latter a somewhat remarkable form, but clearly of this species.) We have also had this pretty species in cultivation. The corolla is rich rose-color, as described in the letter-press, but with none of the deep red given in the figure in the Botanical Magazine.

PENTSTEMON SPECTABILIS (*Thurber, MSS.; Torr. & Gray, in Bot. Whipp. Pacif. Railroad*

Rep.) Mountains east of San Diego; *Parry.* San Pasqual, California; *Thurber, Schott.* Dry ravines, Organ mountains, New Mexico; *Bigelow, Wright,* (1475.) These specimens of this well-marked and showy species, though not displaying such an ample panicle of flowers as do the Californian ones from Thurber and Mr. Wallace, evidently belong to the same species. It pertains to the section Cepocosmus.

PENTSTEMON FENDLERI, *Gray, in Bot. Pope's Rep. p.* 12, *t.* 5. Common apparently, from the Platte through New Mexico and the Rocky mountains to Chihuahua, (*Wislizenus,* No. 245,) and brought by all the collectors. It is Fendler's No. 576, and Wright's 1473. (This clearly is not distinct from P. cyananthus, *Hook. Bot. Mag., t.* 4464, which was overlooked when P. Fendleri was characterized; it must accordingly bear that name.)

PENTSTEMON GRACILIS, *Nutt. Gen. p.* 52. Near the Guadalupe river, above Victoria, Texas; *Schott.*

PENTSTEMON DIGITALIS, *Nutt. in Trans. Amer. Phil. Soc. n. ser.* 5, *p.* 181. Rio Hondo, Texas; *Wright.*

PENTSTEMON BARBATUS, *Nutt.; Benth. in DC. Prodr.* 10, *p.* 329. P. Torreyi, *Benth.! l. c. p.* 324. Common in New Mexico, along the mountains; *Fendler,* (581,) *Wright,* (440, 1474); *Bigelow,* etc. Santa Cruz mountain; *Captain E. K. Smith.* We have this in cultivation from Mr. Wright's seeds. It is hardy at Cambridge, and is taller (4 to 6 feet high) than the commonly cultivated P. barbatus, as well as fuller-flowered; the virgate panicle becoming 2 or 5 feet in length, and bearing a long succession of fine scarlet blossoms, in some plants of the most brilliant hue. The calyx-segments are either marginless or slightly margined. The lower lip of the corolla at the throat is bearded, either somewhat copiously or sparingly, or in some plants the beard wholly disappears, so that the name *barbatus* is not characteristic of this species. But that all our forms are specifically identical with the old Chelone barbata I cannot doubt. In establishing his P. Torreyi, Mr. Bentham, who is generally so very accurate, has made two mistakes; the first, into which he was naturally led by the imperfection of the original specimens, was in referring his plant to the section Cepocosmus, and comparing it with P. imberbis, whereas it is a genuine Elmigera, having the upper lip erect, concave, and moderately two-lobed, the lower 3-parted and reflexed; the second in attributing to P. barbatus a bearded sterile filament, whereas it has always been described as with a naked one, conformably to the distinction formerly taken in this respect between Chelone and Pentstemon.

PENTSTEMON BARBATUS, var. PUBERULUS. Guadalupe cañon, May, 1851; *Thurber.* In every respect it is P. barbatus, but with a minute pubescence on the stem and leaves.

PENTSTEMON BACCHARIFOLIUS, *Hook. Bot. Mag., t.* 4627. Rocky bluffs at the Big Bend of the San Pedro river, Texas; *Wright,* (439, 1479.) This showy species has been found only by Mr. Wright, who discovered it in 1849. From seeds gathered by him it has been raised both in England and in the Cambridge Botanic Garden. Overlooking Hooker's publication of the species, I had named it P. Grahami, in compliment to Colonel Graham, United States Topographical Engineers, under whose command Mr. Wright was when he, for the second time, met with the plant; but the name has not appeared in print, so far as I am aware. The figure in the Botanical Magazine does feeble justice to the very deep and carmine corolla, and represents the plant as coarser and the leaves as considerably larger than usual. The latter in the wild specimens are only ½—1 inch long, and very thick and firm. Far from being "annual?" the plant is shrubby. The upper lip of the corolla is erect or at length somewhat recurved; the lower shorter, 3-parted and recurved. The plant is ambiguous between the sections Cepocosmus and Elmigera.

PENTSTEMON CORDIFOLIUS, *Benth. Scroph. Ind. p. 7, adnot & in DC. Prodr.* 10, *p.* 329. Mountains east of San Diego, California; June; *Parry.* Near the town of the same name; May; *Thurber.* Santa Barbara; *Major O. Rich.* This species differs from all the rest of the genus in its somewhat climbing habit. It runs over tall bushes like a Lonicera, and has bright scarlet flowers, which are resupinate.

PENTSTEMON TERNATUS, (*Torr. MSS.*): glaber; caulibus e basi fruticosa erectis; foliis ternatim verticillatis lanceolatis argute denticulatis utrinque acutis; panicula laxa pauciflora; corollæ tubo elongato vix ampliato labio recto; filamento sterili barbato.—Mountains east of San Diego; June; *Parry.* Branches straight and slender. Leaves about one inch long. Flowers in terminal racemose panicles. Pedicels verticillate. Segments of the calyx ovate-lanceolate, acuminate. Corolla nearly an inch long, pale scarlet according to *Dr. Parry.* This species belongs to the section Elmigera of Bentham.

PENTSTEMON CENTRANTHIFOLIUS, *Benth. Scroph. Ind. p.* 7, *adnot. & in DC. Prodr.* 10, *p.* 323. Mountains east of San Diego, California; June; *Parry.* Also near Monterey; *Dr. Andrews and Mr. Shelton.* A fine deep scarlet-flowered species, with the leaves very variable in breadth.

PENTSTEMON BREVIFLORUS, *Lindl. Bot. Reg. t.* 1946*; Benth. in DC. Prodr.* 10, *p.* 329. California, (near Monterey;) *Rev. A. Fitch.* A rare and remarkable species; also found by Dr. Bigelow on the Stanislaus river. Corolla yellow, except the lobes of the lower lip, which are pale purple.

PENTSTEMON HETEROPHYLLUS, *Lindl. Bot. Reg., t.* 1899; *Benth. in DC. Prodr.* 10, *p.* 300; *Gray in Bot. Whipp. Rep.* Mountains east of San Diego, California; June; *Parry.* Near Monterey; *Dr Andrews.* Our specimens appear to be suffrutescent. The flowers are pale purple.

PENTSTEMON ANTIRRHINOIDES, *Benth. in DC. Prodr.* 10, *p.* 594. Dry valleys among the mountains east of San Diego, California; June; *Parry.* San Pasqual; *Thurber;* May. A rare shrubby species, 3 or 4 feet high.

LEUCOPHYLLUM TEXANUM, *Benth. in DC. Prodr.* 10, *p.* 344. Common in southern and western Texas, occurring in all the collections. The stigma is bilamellate, as described by *Kunze,* but the two lamellæ commonly cohere. This must be a beautiful shrub when loaded, as it often is, with its rich violet-purple blossoms, contrasting with its silvery white foliage. In the finest specimens the limb of the corolla is fully an inch in diameter, and delicately soft-bearded within, and the wide tube two-thirds of an inch long to the base of the lobes. Sometimes the fifth stamen is present and imperfectly antheriferous.

LEUCOPHYLLUM MINUS (sp. nov.): humile; foliis obovato-spathulatis retusis pube minuta argenteis; calycis laciniis linearibus; corollæ lobis tubo dimidio brevioribus.—Hills on and near the Pecos; *Wright,* (442, 1481.) Between Van Horn's Wells and Muerta; *Bigelow, Parry.* A low, spreading shrub, only two feet high; the tomentum much finer and closer than in the foregoing, and the purple flowers not half the size. Leaves from a quarter to half an inch long, including the petiole or tapering base. I am not sure that this is specifically distinct from L. ambiguum, having no specimen of that species. The corolla is, however, as deeply cleft as in L. Texanum.

MIMULUS LUTEUS, *L.; Benth. in DC. Prodr.* 10, *p.* 370; var. gracilis; floribus minoribus. (Near M. Scouleri; *Hook;* which can be only a form of M. luteus.) Copper Mines, New Mexico, and near Cruces; *Bigelow.* Gila valley; *Schott.* Napa county, California; *Thurber.* San Luis Obispo; *Parry.* The capsule of this species accords with the generic character, as given by Bentham, &c., except that the membranaceous valves scarcely, if at all, separate from the undivided placenta, but remain coherent by means of the thin and short partitions.

MIMULUS GLABRATUS, *H. B. K. Nov. Gen. & Spec.* 2, *p.* 370; *Benth. l. c.* Copper Mines and Mimbres, New Mexico; *Bigelow; Wright.,* (1842,) *&c.* Ojo Francisco and Tucson, Sonora; *Parry & Capt. S. K. Smith.* Texas; *Wright & Lindheimer.* This appears to vary as much in size and aspect, and to have nearly as large a geographical range as M. luteus; and M. Jamesii is pretty plainly no more than a smaller flowered and almost entire-leaved northern form of it.

MIMULUS BREVIPES, *Benth. Scroph. Ind.* 2, *adnot., & in DC. Prodr.* 10, *p.* 369. Near San Diego, California, May; *Thurber, Parry, etc.* Chiefly narrow-leaved forms, the same as Coulter's No. 640. Bentham indicates it as perennial, but our Douglasian specimens show an annual root; so do those of Thurber. The capsule of this species is ovoid-lanceolate, rather firm and chartaceous in texture, loculicidal and splitting through the axis, separating the two placentæ, which remain adnate to the valves, just as in Diplacus. Through M. rubellus, etc., there is a regular gradation as to the dehiscence between this and the Mimuli with a thin and membranaceous capsule, and a fleshy placenta, which shows no disposition to split.

MIMULUS CARDINALIS, *Dougl.; Benth. l. c.* Near San Diego, and in the mountains westward, California; *Parry.* The valves of the capsule with the partitions in this species tardily separate from the axis, from which the two placentæ are pretty widely separated, being projected far into the cells.

MIMULUS RUBELLUS, (sp. nov.): tenellus, erectus, e radice annua ramosus, viscido-puberulus; foliis anguste oblongis lanceolatisve trinervibus fere integerrimis basi angustatis sessilibus; pedunculis folium plerisque superantibus; calycis oblongi dentibus brevibus aequalibus, ore aequali; corollæ purpureæ tubo haud exserto.—Wet ravines of the Organ mountains and Copper Mines, April; *Bigelow, Wright,* (1483,) and Hueco mountains; *Thurber,* (135.) Plant 2 to 6 inches high. Leaves 3 to 8 lines long, the uppermost acutish. Calyx perfectly equal at the summit, even in fruit, 3 lines long, narrow. Tube of the corolla yellowish, the limb 1½ line long, pink or purple. The valves of the capsule are pretty thin and delicate; but the placenta splits at the summit in dehiscence, or is bipartible, one half remaining adnate to each valve.

MIMULUS (DIPLACUS, *Nutt.*) GLUTINOSUS, *Wendl. Obs., p.* 51. San Francisco, Monterey, and San Diego, California. In various forms, and both with red and yellow flowers. Several annual Mimuli being dehiscent through the placenta in the same way as the present plant, there appears to be no ground for viewing Diplacus as anything more than a marked section of Mimulus, distinguished by its shrubby habit, glutinous foliage, and narrow pods of a firm texture.

EUNANUS FREMONTI, *Benth. in DC. Prodr.* 10, *p.* 374? Dry gravelly places near Monterey, May; *Parry.* Only a single and miserable specimen was gathered. It seems likely to be a state of E. Frémonti, or possibly of Douglasii, with a remarkably abbreviated corolla.

HERPESTIS CHAMÆDRIOIDES, *H. B. K. Nov. Gen. & Spec.* 2, *p.* 369. Santa Cruz, and Sierra Verde, Sonora; *Wright,* (1484,) *Schott.* Also a variety with simpler and less spreading stems, and obscurely toothed leaves (H. nigrescens, *Engelm. & Gray, Pl. Lindh. No.* 140:) between the Pecos and the Limpio; *Wright,* (443,) and Rock Creek; *Bigelow.*

Herpestis rotundifolia, *Pursh, Fl.* 2, *p.* 418. Along the Rio Grande below El Paso; *Wright.* (444.)

Herpestis Monniera, *H. B. K. l. c.* H. cuneifolia, *Pursh.* Monniera cuneifolia, *Michx. Fl.* 2, *p.* 22. Marshy shore of the Rio Grande, between Eagle Pass and Laredo, April; *Schott.* Monterey, Neuvo Leon; *Dr. Edwards.* Chihuahua; *Dr. Gregg.*

Conobea (Schistophragma) intermedia, (sp. nov.): viscoso-pubescens; foliis subpinnatipartitis; floribus brevissime pedunculatis; antheræ loculis subcontiguis; capsula ovato-lanceolata calyce subinæquali dimidio longioribus.—Dry hills around the Copper Mines, New Mexico; very common; *Wright.* (1485). Annual, erect spreading, 2–6 inches high, with the aspect of C. (Leucospora) multifida; only more pubescent; the flowers very short-peduncled; the corolla twice as large, purple, or the lower lip pale. Capsule 3 or 4 lines long, pointed. This connects Bentham's Conobea multifida and his Schistophragma pusilla in such a way as to render it necessary to comprehend under one and the same genus these three species of closely similar aspect. The pod is just intermediate between the ovate shape of the first and the linear form which distinguishes the last; but it has the spirally striate seeds of Schistophragma. Its unequal calyx (the upper sepal being somewhat larger, or at least longer than the others,) would appear to exclude it from Schistophragma no less than from Conobea; but I observe the same thing, only rather less marked, in an authentic specimen of Bentham's S. pusilla var. major, from Santa Martha. The stigma is essentially the same in all three. The present species has one peculiarity: while in its unequal calyx it seems to approach Herpestis, in its anthers, (the cells of which are not side by side, but one inserted a little above the other) it approaches Stemodia and its allies.

Conobea multifida, *Benth. in DC. Prodr.* 10, *p.* 491. Capraria multifida, *Michx. Fl.* 2, *p.* 22, *t.* 35. Common on the sandy shore of the Rio Grande near Eagle Pass, April—May; *Schott.* Rio Coleto, Texas; *Thurber.*

Gratiola pusilla, *Torr. in DC. Prodr.* 10, *p.* 402. On the Colorado, Texas; *Wright.*

Veronica Anagallis, *L.* New Mexico, on the Mimbres; *Wright,* (1487,) *Thurber;* and near the Copper Mines; *Bigelow.*

Veronica peregrina, *L.* On the Rio Grande, near El Paso, and Lake Santa Maria, Chihuahua; *Wright,* (1488.) Plains near Laguna de Lache, Solado, Mexico; *Bigelow.* Tubac; *Parry.* San Bernardino, Chihuahua; *Thurber,* (376.)

Buchnera elongata, *Swartz. Fl. Ind. Occ.* 2, *p.* 1061. Painted Caves and Medina creek, Texas; *Bigelow, Schott.*

Seymeria bipinnatisecta, *Seem. Bot. Herald, p.* 323, *t.* 59, var. Texana: pilis glandulosis et viscidis pubescens seu villosa; ramis subvalidis; foliis bipinatifidis vel superioribus pinnatifidis, segmentis lato-linearibus obtusis inciso-dentatis; pedicellis sæpissime brevibus; antheris obtusissimis; capsulis glandulosis acutatis vel obtusis.—Upper Guadalupe river, etc.; *Lindheimer.* Lower Rio Grande; *Wright.* Head of the Pedro river, Sonora? *Bigelow.* A stouter, more pubescent and glandular plant than S. pectinata, and with the leaves much more cut, sometimes even tripinnatifid. The shape of the capsule varies so in the numerous specimens under examination that I fear it cannot be greatly relied upon in this genus. The above character was drawn up, under a different name, before Seemann's plant was published. I have not seen Mexican specimens. Our plant has less dissected foliage and (except in one or two instances) much shorter pedicels than are delineated in Seemann's figure, and no such incised or pinnatifid calyx-lobes, (which, by the way, are not mentioned in the character,) still the two are likely to fall under the same species.

Seymeria scabra (sp. nov.): hispidulo-scabra, gracilis; foliis linearibus parvis pinnatipartitis paucilobatis superioribus 3–5-fidis integrisve; corolla fere glabra; antheris sagittatis, loculis acutis; capsulis glabellis ovato-acuminatis.—Mountain sides beyond the pass of the Limpio; *Wright*, (448.) Lower leaves wanting; the largest seen little over half an inch in length; the segments narrowly linear 1–2-toothed or entire. Flowers about as large as those of S. pectinata. Calyx-lobes narrowly linear. Capsule fully 4 lines long. Well marked by its anther-cells tapering gradually to an acute point.

Gerardia Wrightii (sp. nov.): caulibus e radice perenni simplicibus virgatis cum foliis lineari-filiformibus mucronato-acutatis scaberrimis; pedunculis flore æquilongis; calyce truncato breviter 5-dentato; corolla flava late campanulata e tubo brevissimo extus pubescente intus glaberrima; filamentis brevibus apice tantum villosis; antheris conformibus nudis obtusissimis basi sagittatis, loculis aristato-subulatis; stigmate clavato.—Hill sides between Babacomori and Santa Cruz, Sonora; *Wright*, (1489,) *Bigelow*. With the habit, calyx, and corolla of a true Gerardia, sect. campanifloræ, this plant has yellow flowers, (according to Mr. Wright's notes taken on the spot,) naked anthers, short-awned at the base, and the filaments glabrous except near the summit. The stamens are pretty strongly didynamous, and the four anthers similar.

Gerardia heterophylla, Nutt.? var. pedunculis calyce dimidio brevioribus; foliis plerisque ultra-pollicaribus. Leone Spring, Texas; *Bigelow*.

Gerardia purpurea, *Linn.* San Pedro river, etc., Texas; *Parry*, *Schott*.

Castilleja indivisa, *Engelm. Pl. Lindh.* 1, *p.* 47; *Benth. in DC. Prodr.* 10, *p.* 530. San Pedro river; *Wright*, (453,) etc.; *Bigelow*. Castle-Mountain Pass, Texas, October; *Thurber*.

Castilleja purpurea, *Don.; Benth. in DC. Prodr.* 10, *p.* 531. Euchroma purpurea, *Nutt.* Texas; *Wright, &c.* Not seen on the Rio Grande, but common further north and east. Well distinguished by the lower lip of the corolla, which is 2½ lines long, but not always half as long as the galea. The calyx is commonly split as deeply behind as before. "Bracts and calyx varying from sulphur yellow to flesh-color, brick-red, and cherry-red, even in the same locality, so that the specific name is not a good one." (*Lindheimer.*) The root is perennial.

Castilleja lanata (sp. nov.): perennis, tomento floccoso simplici denso undique incana; foliis linearibus integerrimis, floralibus nunc trifidis apice coloratis; spica demum interrupta; calycis aequaliter bifidi lobis obovato-oblongis integerrimis retusisve corollæ labium inferius multum superantibus.—Along and near the Rio Grande, from Eagle Pass, etc., to El Paso; *Wright*, (452, 1495), *Bigelow*, *Parry*, etc. On the Limpio; *Wright*, (451.) Near Buena Vista; *Gregg*. A most remarkable white-woolly species, with larger leaves and flowers than C. foliolosa. The latter species is sometimes almost as white, but its tomentum is formed of repeatedly branched hairs, whereas the wool of C. lanata consists of long and simple arachnoid hairs.

Castilleja tomentosa (sp. nov.): perennis, pilis simplicibus laxis cano-lanata; foliis linearibus margine revolutis integerrimis, floralibus trifidis superne coloratis; spica demum interrupta; calycis subaequaliter bifidi lobis semibifidis lanceolatis acutis corollam aequantibus.—Mabibi, Sonora, June, 1851; *Thurber*. Considerably like the last and C. foliolosa, but the wool less dense and floccose than in C. lanata, and the calyx different, and apparently fully as long as the galea. Floral leaves and calyx-lobes red or purple.

Castilleja angustifolia. Euchroma angustifolia & E. Bradburii, *Nutt. in Jour. Acad. Philad.* 7, *p.* 46? On Live Oak creek, the Limpio, etc., *Wright*, (1491, 1492, with yellow bracts and calyx;) also in his first collection, but undistributed. Mr. H. Engelmann collected it at Bridger's Pass. This most likely belongs to Nuttall's species, but the lower leaves are mostly entire. The calyx is not equally 4-cleft, but is equally 2-cleft and the divisions 2-cleft, nearly as in C. purpurea, from which it differs by the short lower lip of the corolla.

CASTILLEJA SESSILIFLORA, *Pursh, Fl.* 2, *p.* 728. Low places near Rock creek and Mule Springs; *Bigelow.* Eagle Pass; *Parry.* Santa Maria, Chihuahua; *Schott.* Mule Springs, New Mexico, May; *Thurber.*

CASTILLEJA HISPIDA, *Benth. in Hook. Fl. Bor.-Am , & in DC. Prodr.* 10, *p.* 532. Dry hills, San Diego, California; *Parry.*

CASTILLEJA INTEGRA (sp. nov.): perennis; caule stricto tomentoso; foliis linearibus integerrimis subtus tomentulosis, floralibus oblongis obovatisque integerrimis coloratis (puniceis); spica conferta; calyce æqualiter vel postice profundius bifido, lobis bifidis lanceolatis obtusiusculis labium inferius galea multoties brevius adaequantibus.—Organ mountains, east of El Paso; *Wright,* (undistributed,) *Bigelow.* Guadaloupe cañon, Sonora; *Capt. E. K. Smith.* Also gathered in the Rocky Mountains further north by Mr. Kreuzfeldt, in Gunnison's expedition. Stem one or two feet high, mostly simple, rigid; leaves 1½ to 3 inches long, 2 to 3 lines wide, entire; most of the floral ones almost wholly petaloid, ample, shorter than the fully developed flowers. Calyx 8 or 12 lines long, red or reddish; "corolla reddish green;" galea 6 to 8 lines long; the lower lip very short Apparently a well marked new species of the section Callichroma. It is No. 584 of Fendler's New Mexican collection; and Dr. Bigelow gathered specimens in Whipple's expedition on the Llano Estacado.

CASTILLEJA AFFINIS, *Hook. & Arn. Bot. Beech. p.* 144; *Benth. l. c., p.* 532; var. MINOR; corolla calyce paullo longiore. Bed of exsiccated streams, near the Copper Mines, New Mexico; *Bigelow, Wright,* (1494.) Santa Maria, Chihuahua; *Bigelow, Wright,* (1493.) Presidio del Norte and Sonora; *Schott.* Los Animos; *Thurber.* Tubac, Sonora; *Parry.* And Santa Cruz Mountains in the same State; *Captain E. K. Smith.* A slender, often branching plant, with an annual or biennial root. Flowers, especially the corolla, very much smaller than in the typical Californian plant (such as Hartweg's No. 1896;) but Hartweg's No. 1897 connects the two. The lobes of the calyx vary from nearly entire to deeply 2-cleft; the tube is often split down deeper on the posterior than the anterior side.

CASTILLEJA LAXA (sp. nov.): herbacea, cinereo-pubescens; caulibus e radice perenni subdiffusis ramosis gracilibus; foliis tenuibus scabridis lineari-lanceolatis integerrimis basi haud dilatatis, floralibus calyce brevioribus, superioribus rubro-coloratis; floribus paucis confertis breviter pedicellatis; calyce rubello antice profundius postice leviter fisso, dentibus brevibus obtusis; corollæ galea magna, lobis labii inferioris brevissimis obtusis.—Mountain sides near Santa Cruz, Sonora; *Wright,* (1490.) This appears to be a well-marked species of the section Hemichroma, with the bracts and calyx more colored than is usual in that section. The thin leaves do not turn blackish in drying; they are mostly about 2 inches long and 3 lines wide; the floral shorter and blunter, the lower mostly green, the upper colored red. Calyx very thin, slightly pubescent, an inch long, exceeding the lower lip of the corolla by 3 or 4 lines, but half or two-thirds of an inch shorter than the ample galea, nearly straight, deeply cleft anteriorly, but on the posterior side only to the depth of 2 or 3 lines; the teeth broad and short. Galea somewhat pubescent on the back, yellowish, the edges tinged with red.

CASTILLEJA LINARIÆFOLIA, *Benth. in DC. Prodr.*, 10, *p.* 532. Arroyos in Sonora; *Thurber.* "Plant 4 to 6 feet high." Though the calyx is rather shorter and the falcate galea longer, this appears to be only C. linariaefolia. To it probably belongs C. fulgens, *Nutt. ined.*, and C. candens, *Durand, Pl. Herrm.* Dr. Bigelow gathered it at Albuquerque, New Mexico, when in Whipple's expedition; and Fendler's No. 583 is a narrow-leaved form of the same species.

Orthocarpus erianthus, *Benth. Scroph. Ind., p.* 12, *& in DC. Prodr.* 10, *p.* 535. Grassy places near San Diego, California, March; *Dr. Parry.*

Orthocarpus densiflorus, *Benth. l. c.* Dry hill sides, Monterey, California, April. Stem nearly simple, but the specimens are early ones, and later in the season no doubt the plant becomes much branched. Lower leaves simple, tapering to a very long narrow point. Appendages of the lower lip rather obtuse.

Orthocarpus lacerus, *Benth. Pl. Hartw., p.* 329. San Luis Obispo, California; *Dr. Parry.*

Orthocarpus purpurascens, *Benth. DC. Prodr.* 10, *p.* 536. Moist grassy places, near Monterey, California, April; *Parry.*

Cordylanthu laxiflorus (sp. nov.): paniculato-ramosus, hirsutissimus, sublandulosus; foliis linearibus brevibus integerrimis rarius trifidis; floribus solitariis vel in ramulos breves adproximatis unibracteatis; calycis lobo postico apice bidentato; corollæ labio inferiori saccato subintegerrimo; antherarum loculo altero abortivo seu in stam. brevioribus plane nullo.—Rocky hills, Sonora, Mexico; *Thurber.* Also Great Salt Lake; *Col. Frémont,* 1843. Plant branched from the base, 1 or 2 feet high, turning dark colored in drying, very hirsute throughout with rather viscid and and sometimes rather glandular spreading hairs; branchlets very numerous, short, very leafy throughout, bearing from one to four or five flowers. Leaves 6 to 9 lines long, about a line wide. Calyx half an inch long, almost equalling the "bright yellow" corolla. Galea nearly straight, broad. Anthers one-celled and with a minute pendulous vestige of the second cell, at least in the longer stamens. A true congener of the Californian species, remarkable for its scattered flowers, and for the abortion of the smaller anther cells.

Cordylanthus Wrightii (sp. nov.): paniculato-ramosus, glabellus, minute glandulosus; foliis 3–5-partitis filiformibus; bracteis conformibus haud ciliatis; floribus subcapitatis; calycis lobo postico 2–3-dentato; antherarum loculo altero pendulo etiam in staminibus brevioribus manifesto. Prairies, from 6 to 30 miles east of El Paso, Western Texas; *Wright,* (450.) Sand hills, Chihuahua; *Thurber.* This, far the most eastern of the genus, was first met with by Mr. Wright, who found it only in the autumn of 1849, in his first expedition, which was attended by many hardships, but which was very rich in its botanical results This species is nearly related to C. filifolius; but it is not so rigid, has finer foliage (without hispid hairs,) less capitate and larger flowers, the more incurved corolla an inch and a quarter long, and the upper lip of the calyx is more or less 2–3-toothed or cleft at the apex. Seeds elongated-oblong, deeply farove-reticulated.

Cordylanthus filifolius, *Nutt.; Benth. in DC. Prodr.* 10, *p.* 597, California, (station not recorded, but probably Monterey;) *Parry, Shelton.* The middle lobe of the involucral bracts is somewhat dilated at the extremity and truncate-emarginate.

Pedicularis centranthera (sp. nov.): acaulis, glabra; foliis pinnatifidis scapum bis superantibus, segmentis ovatis duplicato-dentatis margine denticulisque subcartilagineis discoloribus (albis;) spica oblonga densiflora; calycis cylindracei dentibus 5 aequalibus lanceolatis albido-marginatis; corollæ galea cucullata erostri edentula labio inferiore patente paullo longiore; filamentis glabris; antheris basi eximie bicalcaratis.—New Mexico, and on Ben More, April, *Bigelow;* the specimens from the latter locality nearly past flowering. This is unlike any other Pedicularis that I know of, and is distinguished by its awned or spurred anthers from all known species except P. grandiflora, *Fisch.*, with which it has little else in common. The awns are so long that their tips often project beyond the hooded summit of the galea. Leaves all radical, 6 inches long, broadly linear in outline, fringed with fine and white teeth. Peduncle an inch long, spike (partly in fruit) 3 inches long. Tube of the calyx half an inch long; the lobes 3 lines long, their whitish margins somewhat crisped and erose. Corolla twice the length of the calyx, apparently pale purple; the tube slender; the helmet-shaped galea obtuse and not appendaged. Stamens inserted low down on the tube; anthers 2½ lines long, including the tapering spurs.

PEDICULARIS DENSIFLORA, *Benth. in Hook. Fl. Bor.-Am.* 2, *p.* 110. Dry gravelly plains; abundant near Monterey, California, May; *Parry;* also in Napa county, in the same State, March; *Thurber.*

LOGANIACEÆ.

MITREOLA PETIOLATA, *Torr. & Gray, Fl.* 2, *p.* 45. Wet places on Devil's river, and along the middle and lower Rio Grande; also in Santa Rosa valley, Chihuahua, September to October. Leaves larger and broader than usual.

POLYPREMUM PROCUMBENS, *Linn. in Act. Ups.* (1741,) *t.* 78; *Torr. & Gray, l. c.; Cham. & Schlecht. in Linnœa*, 5, *p.* 173. Common on the Lower Rio Grande, April; *Schott.*

BUDDLEIA HUMBOLDTIANA, *Roem. & Schult.* Rinconada Pass, December; *Thurber.*

BUDDLEIA MARRUBIIFOLIA, *Benth. in DC. Prodr.* 10, *p.* 441. On the Rio Grande from the mouth of the Pecos to Presidio del Norte; *Parry, Bigelow.* A neat shrub, 3–5 feet high, with heads of golden yellow odorous flowers, which turn to orange red. It is No. 1407 and 1780 of Berlandier's Coll.; 311 of Wislizenius, and 444 Gregg.

BUDDLEIA SCORDIOIDES, *H. B. K. Nov. Gen. & Spec.* 2, *p.* 345, *t.* 183. Valley of the Pecos, and in Sonora; *Wright*, (No. 447, 1486.) Mountains of Muerte, July; *Bigelow.* On the Rio Grande, below San Carlos, October; *Parry.* Coralitas, Chihuahua, August; *Thurber.*

BUDDLEIA RACEMOSA (n. sp.): fruticosa, 1–3-pedalis; foliis oblongis subovatisve obtusis inaequaliter crenato-dentatis basi subhastatis truncatisve raro abrupte cuneatis petiolatis glabratis subtus ramisque junioribus pulverulenteo-canescentibus atormiferis; capitulis globosis plurifloris breviter seu longiuscule pedunculatis in racemum virgatum elongatum fere nudum dispositis; tubo corollæ calyce tomentoso brevioribus. (Upper Guadalupe, etc., Texas; *Riddell, Lindheimer, Wright, Ervendberg.*) August, November. Var. *incana:* foliis pube mollissima supra tenuiter tomentuloso subtus crebre tomentoso incanis. San Pedro river; *Wright*, (446.)

EMORYA, Nov. Gen.

Omnino Buddleia, nisi filamenta stylusque exserta capillaria. Frutex 3–6-pedalis, ramosus; foliis oblongis subhastatis sinuato dentatis discoloribus; inflorescentia laxa racemoso-thyrsoidea; floribus sesqui-pollicaribus viridi-ochroleucis.

EMORYA SUAVEOLENS, (TABLE XXXVI.) Cañons of the Rio Grande, below the Presidio del Norte, October; *Parry.* Leaves opposite, 1—2 inches long, and from half an inch to an inch and a half broad, sinuately or repandly toothed, very obtuse or truncate at the base, glabrate above, whitish tomentose underneath; petioles scarcely half the length of the lamina, connected at the base by an elevated ring. Flowers in terminal cymulose panicles, sweet-scented; pedicels bibracteolate, the bracteoles subulate. Calyx tubular, 4–8-costate, 4-cleft nearly to the middle; segments nearly equal, linear-lanceolate erect. Corolla tubular, elongated, three times as long as the calyx, equally 4-cleft, the segments short and obtuse. Stamens 4, subaequal, exserted; anthers 2-celled, bifid at the base, mucronulate at the summit; filaments slender, very smooth, inserted into the middle of the tube of the corolla. Ovary oblong-conical, the base surrounded by a glandular ring. Style conspicuously exserted, filiform, smooth, except at the base, which is a little pubescent, somewhat clavate at the summit; stigma small, capitate. Capsule oblong, apiculate, 2-celled, septicidal; valves 2-cleft at the summit; placentae thick, adnate to the axis. Seeds numerous, imbricated, the testa loose, cristate at both ends twice the length of the nucleus. Embryo straight. We have seen one or two pentamerous flowers. This genus is dedicated to Major William H. Emory, United States Commissioner to the Mexican Boundary Survey, who has taken the liveliest interest in the botany of the region explored under his command, and has afforded every facility to the gentlemen who had that department of science in charge. Mr. Miers, to whom we sent specimens of this plant, thought it might be referred to the tribe Buddleiæ. Indeed it is nearly related to Buddleia itself.

ACANTHACEÆ.

ELYTRARIA TRIDENTATA, *Vahl. var.* CAULESCENS, *Nees, in DC. Prodr.* 11, *p.* 64. Guadaloupe cañon, etc. Sonora; *Capt. E. K. Smtth, Schott, Thurber.* Lower California; *Mr. Rich.* (No. 1647, *Wright.* No. 1207, *Coulter;* Mexico.)

CALOPHANES OBLONGIFOLIUS, *D. Don. in Sweet Fl. Gard.* 2, *t.* 181; *Nees, l. c. p.* 107. Valley of the Santa Cruz river, etc., Sonora; *Capt. E. K. Smith, Thurber.* Plains between Van Horn's Wells and Muerte, and down the valley of the Rio Grande to the Gulf of Mexico. (No. 1462, *Wright.*)

C. OBLONGIFOLIUS, var. TEXENSIS, *Nees, l. c., p.* 108. C. linearis, *Engelm. & Gray, Pl. Lindh.* 2, *p.* 50, (*adnot.*) Common along the middle Rio Grande on both sides of the river, and in Sonora; flowering from April to September. (Nos. 1463 and 1464, *Wright.*)

CRYPHIANTHUS BARBADENSIS, *Nees, Del. Sem. Hort. Vratisl.* 1841, *& in DC. Prodr.* 11, *p.* 197. Dipteracanthus nudiflorus, *Engelm. & Gray, l. c., p.* 21. Moist places in central and western Texas, particularly along the lower Rio Grande; *Schott, Bigelow.* (Nos. 1454 and 1455, *Wright.*) Ruellia alba, *Nees* is, perhaps, not distinct.

DIPTERACANTHUS? SUFFRUTICOSUS (n. sp.): caule glabro inferne fruticoso erecto; foliis obovato-oblongis glabriusculis subcoriaceis basi in petiolem attenuatis, margine retrorsum ciliatis; pedunculis axillaribus 1-floris; bracteolis oblongo-lanceolatis; calycis laciniis lanceolato-linearibus tubo corollæ elongato gracili subtriplo brevioribus. Presidio del Norte; July—August; *Parry.* Sides of rocky hills, valley of the Pecos. No. 1461, *Wright.* Plant apparently about a foot high. Leaves 1–1¾ inch long, acute or obtuse, smooth or slightly pubescent. Peduncles 2–4 lines long, the bracts a little longer than the calyx. Segments of the calyx sparsely ciliate. Corolla white; the tube 1½ inch long, very slender, somewhat dilated at the summit; lobes of the limb roundish-obovate. Stigma simple, (the inferior lobe abortive.) Capsules 4-seeded; seeds hispid. This is the only suffruticose species of this genus known within the limits of our Flora.

STENANDRIUM BARBATUM, *Torr. & Gray, Bot. Pope's Rep. p.* 13, *t.* 4. Mountains and hill sides along the Rio Grande from El Paso to the mouth of the Pecos; March—April. (No. 1453, *Wright.*) Stem branching from a thick wood base. Flowers pale purple.

SCHAUERIA PARVIFOLIA (n. sp.): suffruticosa e basi ramosorissima glanduloso-pubescens; foliis oblongis ovatisve acutis; spicis terminalibus subpaniculatis interruptis; floribus oppositis sessilibus bracteis bracteolisque subulatis; calycis laciniis lanceolato-subulatis; corolla (purpureo) subbilaliata, labio superiore integro vel vix emarginato, labiis oblongis æqualibus, labio inferiore profunde trifido; antherarum loculis parallelis contiguis muticis. Mountains and rocky places on the Cibolo of the Rio Grande; August; *Bigelow*. Monterey, Nuevo Leon; *Dr. Edwards*, *Dr. Gregg*. Howard Springs; *Schott*. (No. 1460, *Wright*. No. 1459 is an early state of the same, in which the flowering branches or spikes are not developed.) At Oak creek, western Texas, Mr. Schott collected specimens with larger and almost orbicular obscurely repand leaves. They probably grew in a shady place. Plant 6–12 inches long, sometimes diffuse. Leaves ½ to 1 inch in length, abruptly narrowed to a petiole which is 3 to 6 lines long. Flowers in loose compound spikes or panicles terminating the branches. Segments of the calyx subulate. Corolla 4–5 lines long; the segments nearly equal and about as long as the tube. Capsule 5 lines long, the lower half abruptly contracted and stipe-like; the upper part orbicular-ovate, acuminate, smooth, 4-seeded. Seeds discoid, muriculate, black.

SCHAUERIA LINEARIFOLIA (n. sp.:) suffruticosa e basi ramosissima glaberrima; foliis angusto-linearibus; spicis terminalibus gracilibus paniculatis, floribus distantibus, bracteis bracteolisque subulatis; calycis laciniis lanceolato-subulatis, corolla (purpurea) subbilabiata laciniis oblongis subæqualibus; antherarum loculis parallelis contiguis muticis. Rocks at the mouth of the Great cañon of the Rio Grande, and on the Burro mountains; June—October; *Bigelow*, *Parry*. (No. 436, *Wright*.) About a foot high. Leaves 8–10 lines long; the lowest ones a little broader and somewhat spatulate; upper ones half a line wide. Flowers solitary in the upper axils, the leaves being gradually reduced to subulate bracts, so that the inflorescence becomes spicate. Calyx, corolla, and fruit, as in the preceding species.

DREJERA[*] WRIGHTII (n. sp.): ramis bifariam pubescentibus; foliis oblongo-lanceolatis acuminatis glabris, spicis unilateralibus nudis; calyce glanduloso-pubescente profunde 5-fido, laciniis oblongo-lanceolatis; corollæ tubo angusto calyce multoties longiore, labio inferiore tripartito, laciniis lanceolato-linearibus. Between the Guadaloupe river, Texas, and the Rio Grande; also near Monterey, Nuevo Leon; June—October. Nos. 435 and 1457, *Wright*. Plant apparently 3 to 4 feet high; dull grayish green; the branches terete, marked with two broad lines of soft pubescence. Leaves 1½–2 inches long, and 6–8 lines wide; green on both sides; the petiole 3–5 lines long. Spikes terminating the paniculate branches. Bracts about as long as the very short pedicels. Corolla an inch and a half long; purplish red; the tube slender, inflated at the base, the enlarged portion about the length of the calyx; segments of the upper lip a line and a half wide; upper lip emarginate. Anther-cells linear, contiguous, parallel. Capsule smooth, 6–7 lines long, the upper half rhombic-ovate and semeniferous; the lower attenuated to a narrow stipe and empty. Seeds commonly 2, rarely 3 or 4, lenticular, smooth.

DREJERA PUBERULA, (n. sp.): ramis bifariam pubescentibus; foliis oblongo-lanceolatis vel lineari-lanceolatis puberulis brevipetiolatis; spicis brevibus axillaribus terminalibusque foliosis; calyce glanduloso-pubescente profunde 5-fido, laciniis lineari-subulatis; corollæ tubo angusto calyce multoties longiore, labio inferiore tripartito, laciniis lanceolato-linearibus. Gravelly hills and ravines along the Cibolo of the Rio Grande; May—June; *Bigelow*. No. 1456,

---

[*] We have adopted Œrsted's view of the limits of Drejera, (in Vidensk. Medd. Naturhist For Kjobenh. 1854, p. 154,) merely extending the character as to the calyx, which is 5-cleft or 5-parted. It includes Drejera, *Nees*, and Jacobinia § 2 of the same author in *DC. Prodr.* The latter genus was founded on *J. lepida*, and is the only species referred by Nees, to his first section. It differs so much from the species of the second group, which we would transfer to Drejera, that it may remain by itself.

Wright. Valley of the Rio Conchos, below Santa Rosa, Chihuahua; *Gregg.* A narrow leaved form; collected form is No. 1237, *Berlandier.* Collected at San Juan del Rio, between the city of Mexico and Queretaro. A shrub 4 to 8 feet high. Leaves 1–2½ inches long, sparsely pubescent on both sides; petioles 1–3 lines long. Flowers and fruit nearly as in the preceding species.

DREJERA THURBERI (n. sp.): foliis (parvis) oblongis lanceolatisve pubescentibus; floribus fasciculatis quasi verticillatis foliis longioribus; calyce glanduloso-pubescente profunde 5-partitis, laciniis subulato-setaceis glanduloso-pubescentibus hirsutisve corollæ tubo vix triplo-brevioribus. Along water-courses, Las Animas, Sonora; June; *Thurber.* Sierra del Pajarito; *Schott.* Cañon of Guadaloupe; April; *Capt. E. K. Smith.* An ornamental shrub, 3–4 feet high, with a gray or whitish bark that separates in shreds. Leaves about three-quarters of an inch long, obtuse and acute. Flowers mostly resupinate. Corolla dull red, an inch or more in length; the tube funnel-form; lower lip 3-parted, the divisions linear-lanceolate. Capsules mostly 2-seeded, as long as the fructiferous calyx.

DREJERA JUNCEA (n. sp.): aphylla (an semper?); ramis virgatis minute pubescentibus; spicis remotifloris paniculatis; calyce profunde 5-fido glabrescente, laciniis subulatis corollæ tubo angusto multo brevioribus. In a sandy ravine, La Peña, Cohahuila; November; *Thurber.* Plant 3–4 feet high, entirely leafless where found by Mr. Thurber, but it may bear leaves early in the season. Flowers sessile in unilateral spikes, without either bracts or bracteoles. Calyx at first somewhat pubescent, but at length nearly or quite smooth. "Corolla scarlet," an inch or more in length; the tube slender; lower lip deeply 3-parted, the divisions linear and narrow. Capsule ovate above the middle, tapering to a narrow base below; 2-seeded. Besides the four species of Drejera here described, we have, from the collections of Dr. Gregg, another, which does not appear to have been noticed hitherto. It was found on the battle field of Paso del Gallinero. The specimens are not sufficient for a full description, but the following character will serve for its identification:

DREJERA GREGGII (n. sp.): ramis bifariam pubescentibus; foliis ovatis scabriuscule pubescentibus subulato-venosis; floribus fasciculatis foliis longioribus; calyce incano pubescente, lobis lanceolatis tubo subæqualibus. A stout shrub. Leaves 1–1½ inch long, somewhat roughly pubescent on both surfaces; petioles 1–2 lines long. Flowers dull purplish red, 1½ inch long; the segments of the lower lip nearly as long as the tube, and very narrow. Fruit not known.

LIPHONOGLOSSA PILOSELLA. Monechma Pilosella, *Nees, l. c., p.* 412. Adhatoda dipteracantha, *Nees, l. c., p.* 396. Western Texas, on the Lower Rio Grande, and in the adjoining Mexican States, common; flowering throughout the summer. (No. 1458, *Wright,* 396, 1850, and 501, 1845, *Lindheimer.* Plant 6 to 12 inches high, suffruticose, much branched. Leaves half an inch to one and a half inch long. Flowers three-fourths of an inch long, pale purple. This plant is not a Monechma, for the capsule is 4-seeded, and the habit is different. It is still further removed from Adhatoda. We think it belongs to the genus Siphonoglossa, (*Œrsted, l. c., p.* 159,) the character of which must be slightly modified to receive it. The calyx is 5-parted and the narrow upper lip of the corolla is emarginate. The anther-cells are nearly parallel and placed one above the other; the lower one conspicuously mucronate, and the upper one less so. No. 1213 of Coulter's Mexican collection is apparently an undescribed species of this genus.

DIANTHERA AMERICANA, *Linn. Sp.* 1, *p.* 27; *Torr. Fl. N. York,* 2, *p.* 27. Justicia pedunculosa, *Michx. Fl.* 1, *p.* 7. Rhytiglossa pedunculosa, *Nees, l. c., p.* 339. Middle and western Texas.

Adatoda dipteracantha, *Nees, l. c., p.* 396. Rio Leona, Rio San Pedro and near Eagle Pass, Western Texas; March, April; *Schott, Bigelow.* (No. 1458, *Wright.*) Valley of the Conchos and near Los Garzas; *Gregg.* Monterey, Neuvo Leon; *Dr. Edwards.* A stouter form, more pubescent and with the stem decidedly shrubby at the base, was found on the mountains of Muerte by *Bigelow.* It is No. 434 of Wright's earlier collection, and may be Monechma Pilosella, *Nees.*

Sericographis Californica (*Gray MSS.*): "foliis parvis ovalibus ovatis vel subcordatis, utrinque cum ramis teretibus pube molli brevissima tomentulosis; racemis brevibus laxifloris; floribus aut breviter aut longiuscule pedicellatis; bracteolis lineari-subulatis calyce brevioribus; corolla rubella longe tubulosa, labiis truncatis, superiore emarginato, inferiore 3-dentato; antherarum loculis subæqualibus sejunctis, inferiore basi calcare obtuso brevi incurvo auctis. Beloperone Californica; *Benth. Bot. Voy. Sulph. p.* 38? Jacobina Californica, *Nees in DC. Prodr.* 11, *p.* 729. Southern part of California; *Frémont.* Vallecita, California; *Thurber.* Although not agreeing in every respect with the description, these incomplete specimens probably belong to Bentham's Beloperone Californica, which Nees has not inaptly referred to his genus Jacobinia; but it surely belongs to Sericographis. It has the hairy lines, answering to the bases of the suppressed stamens, well-marked. In one blossom there were three perfect stamens. The upper lip of the corolla neatly shows the two long membranous lamellæ which connive and form a long channel containing in the bud the upper part of the style; a character which Œrsted has added to the description of this and some related genera." A. Gray.

Adhatoda? longiflora (n. sp.): caule erecto minute pubescente suffruticoso; foliis lanceolato-oblongis glabris sursum angustatis acutiusculis basi in petiolum attenuatis floribus fasciculatis axillaribus terminalibusque sessilibus, tubo corollæ elongato gracili. Road between Zuñi and Alta Sonora, September; *Schott.* Plant apparently about a foot high; branches erect and slender. Leaves (including the petiole) 1½–2 inches long and 3–5 lines wide, entire, nearly smooth. Flowers fascicled in the uppermost axils. Calyx a little shorter than the lanceolate bracts and longer than the subulate bracteoles, the segments subulate. Corolla white?; border 4-lobed, the three lower segments oblong, the upper segments bifid at the summit. Stamens 2, exserted; anther-cells separate, one placed above the other, obtuse at the summit, acute at the base. Ovary 4-ovuled. This seems to be distinct from any species of the genus described by Nees.

Dicliptera resupinata, *Juss. in Ann. du Mus.* 9, *p.* 268 *fide Nees, l. c., p.* 474? D. thlaspoides, *Nees, l. c.* Santa Magdalena and Bacuachi, Sonora, September, October; *Thurber, Schott.* (No. 1465, *Wright.*) Our plant is a perennial, and some of the specimens seem to be even suffruticose, but D. resupinata and thlaspoides are said to be annuals. The length of the peduncle is variable; in *Schott's* and *Wright's* specimens it is as long as the lateral divisions, but in *Thurber's* they are sometimes very short, and the middle division much elongated. The heads, also, although mostly 1-flowered, are sometimes 2-flowered. The bracts are mostly broadly cordate, but in Mr. Thurber's specimens from Bacuachi they are ovate and obovate.

Tetramerium nervosum, *Nees in Benth. Bot. Sulph. p.* 148, *t.* 48. Var. hispidum foliis ovato-oblongis obtusiusculis vel acutis (non acuminatis.) Santa Cruz and Fronteras, Sonora, June, September; *Thurber.* Sierra de los Janos, in the same State; *Schott.* Rocky hills, Santa Rosa, Chihuahua; *Bigelow.* Valley of a mountain stream near Sonoita, Sonora; No. 1466, *Wright.* Sierra de San Carlos, Tamaulipas; *Berlandier,* No. 3181. Mexico; *Coulter,* No. 1206. Our plant accords very nearly with the description and figure here quoted, but almost equally with the T. polystachyum and T. hispidum, which seem to be scarcely distinct from T. nervosum. The bracts are both appressed, and with spreading or even recurved tips, in the same specimen. The base of the stem is more or less woody.

Tetramerium platystegium (n. sp.): caule minutissime pubescente; foliis oblongo-lanceolatis inferioribus obtusis superioribus acutiusculis utrinque scabriuscule puberulis; spicis ovatis terminalibus; bracteis late cordatis acuminatis appressis membranaceis leviter 3-5-nervibus; calyce 5-partito; corolla bracteis subæquantibus, tubo gracili, limbi laciniis oblongis subæqualibus. Ringgold barracks near Rio Grande City, on the Lower Rio Grande; May; *Schott.* Stem much branched; the branches erect and slender. Leaves 1–2 inches long and 4–6 lines wide, abruptly narrowed at the base into a petiole which is 2–3 lines long. Spikes 1 to 1½ inch long. Bracts 6–7 lines long and 5–6 lines wide, with a short mucronate acumination, closely sessile, somewhat roughly puberulous. Calyx much shorter than the tube of the corolla, the segments subulate-lanceolate. Corolla purple, subbilabrate, the divisions obtuse. Stamens 2, inserted at the summit of the tube of the corolla; anther-cells parallel, contiguous, rather acute at the base. Stigma minute, capitate, 2-lobed. Capsule narrowed at the base, ovate above the middle, 4-seeded. Seeds lenticular, muricate. In the 5-parted calyx this species differs from Tetramerium, as the genus is characterized by Nees; but in T. ovatum, *Œrst.* the calyx is also 5-parted.

VERBENACEÆ.

Bouchea linifolia, *Gray in Sill. Jour.* (*ser.* 2,) 16, *p.* 98, (*sine desc.*): suffruticosa? glaberrima; ramis sulcato-angulatis; foliis linearibus vel lanceolato-linearibus acutissimis integerrimis; spicis laxiusculis; floribus subsessilibus; bracteis subulatis calyce multo-brevioribus; capsula calyce breviore. Valley of the San Pedro, Western Texas; September, October; *Schott.* (Nos. 436, 449, and 1509, *Wright.*) Plants a foot or more high, with long, slender, erect branches. Leaves 1—2 inches long and 1–2 lines wide. Spike 2–4 inches long. Calyx cylindrical; the subulate teeth scarcely one-fourth the length of the tube. Capsule obtuse, villous at the summit.

Bouchea spathulata (n. sp.): suffruticosa; ramis teretibus; foliis crebris obovatis integerrimis obtusis vel brevissime mucronatis puberulis; spicis laxis; floribus sessilibus; bracteis foliaceis oblanceolatis, capsula calyce breviore acuta. Great Cañon of the Rio Grande near Mount Carmel; October; *Parry.* Plant 1–2 feet high. Leaves about three-fourths of an inch long, often fascicled in the axils and crowded on the short branchlets, somewhat scabro-puberulous. Bracts nearly as long as the calyx. Tube of the corolla nearly three-fourths of an inch long, and the limb half an inch in diameter.

Bouchea Ehrenbergii, *Cham.; Schauer in DC. Prodr.* 11, p. 558. Sonora, Mexico; *Thurber.* (No. 1508, *Wright.*)

Lippia Wrightii, *Gray in Sill. Jour. l. c.* Aloysia scorodonoides, *H. B. K. nov. Gen. & Sp.* 2, *p.* 260: ramis subtetragonis patentibus, junioribus pedunculisque pulvereo-canescentibus; foliis oppositis ovatis in petiolum brevem angustatis obtusis crenatis reticulato-rugosis supra scabro-hirtis subtus tomentoso-candicantibus; pedunculis axillaribus folium subæquantibus; spicis cylindricis laxiusculis; bracteis ellipticis acutis calyce longioribus; calyce ovato hirsuto, dentibus ovatis. Rocky hills along the Cibolo of the Rio Grande, August; near the Hot Springs, and on the Burro mountains; September, November; *Bigelow.* Presidio del Norte, September; *Parry.* (No. 460 and 1506, *Wright.*) Sonora and Chihuahua, September, November; *Thurber.* A shrub 2–4 feet high, with numerous slender spreading branches. Leaves half an inch to three-fourths of an inch long, abruptly tapering at the base into a short petiole. Spikes 1–2 inches long in the axils of the upper leaves, often forming a terminal panicle. Flowers at first closely approximated, but becoming more or less distinct. Calyx densely clothed with white hairs, about a line long. Corolla nearly twice as long as the calyx.

Var. MACROSTACHYA: foliis basi subcordatis; spicis longissimis. Cretaceous rocks near Ringgold Barracks on the Rio Grande; June; *Schott.* West of Cerralbo; May; *Gregg.*

LIPPIA LYCIOIDES, *Stend. Nomencl. ed.* 2, *pars* 2, *p.* 54; *Schauer, l. c.* Rocky places along the Rio Grande and its tributaries from El Paso to the Gulf; also Chihuahua, Cohahuila and Nuevo Leon, April—October. (No. 1505, *Wright.* No. 2547 and 3004, *Berlandier.*) A shrub, commonly 3–5 feet high, but sometimes attaining the height of 10 feet. Flowers very fragrant.

Var. foliis ternis majoribus acutis grosse serrato-dentatis. Presidio del Norte; August; *Bigelow.*

Var. foliis oppositis pauci serrato-dentatis obtusis. Presidio de Rio Grande; *Parry.*

LIPPIA BERLANDIERI, *Schauer, l. c., p.* 575. Plains near San Felipe, September: also hills and stony places near Eagle Pass; *Bigelow.* Cretaceous hills on the Lower Rio Grande, March—October; *Schott.* Mount Carmel cañon, October; *Parry.* Plant suffruticose, 2–3 feet high. (Nos. 459 and 1507, *Wright*; Nos. 832 and 2252, *Berlandier.*)

LIPPIA GEMINATA, *H. B. K. Nov. Gen. & Sp.* 2, *p.* 215; *Schauer, l. c., p.* 582. On the Rio Grande, from Ringgold Barracks downward. This exactly accords with Berlandier's plant, except that the leaves are smaller.

LIPPIA NODIFLORA, *Michx. Fl.* 2, *p.* 15; *Schauer, l. c.* San Luis Rey, California, September; *Parry.* Common along the Rio Grande.

LANTANA CANESCENS, (*H. B. K. Nov. Gen. & Sp.* 2, *p.* 259; *Schauer in DC. Prodr.* 11, *p.* 607) foliis oppositis ternisve ovato-lanceolatis leviter crenato-serratis basi in petiolum brevem attenuatis supra scabriusculis subtus molliter incano-pubescentibus; pedunculis folium subæquantibus; capitulis vix involucratis demum ovatis. Santa Rosa, Cohahuila; *Bigelow.* This corresponds so minutely with the description of L. canescens *DC. Prodr.*, except in the leaves being sometimes ternate, that little doubt can exist as to its being the same species. It occurs in none of the collections but those of Dr. Bigelow.

LANTANA MACROPODA (n. sp.): suffruticosa, inermis, appresse hirsutula; foliis ovatis grosse et acute seratis basi abrupte attenuatis utrinque scabriusculis subtus pallidioribus; pedunculis folio 2–3-plo-longioribus; capitulis paullo elongatis; bracteis ovatis cuspidato-acuminatis, extimis majoribus involucrantibus; fructibus exsuccis. Ravines and rocky places on the Rio Grande, from the mouth of the Rio San Pedro to 200 miles above; flowering the whole season. Saltillo; *Gregg*; (Nos. 458 and 4513, *Wright.*) Stem 2–3 feet high, obtusely quadrangular. Leaves opposite, 1–2 inches long, somewhat scabrous with a short appressed hirsute pubescence; veins prominent underneath; petiole or attenuated base of the leaf, about half as long as the lamina. Peduncles 3—6 inches long; heads at first hemispherical, but at length ovate; the rhachis cylindrical and faveolate. Flowers sweet-scented; corolla white; the tube scarcely exserted. Mature fruit about the size of a hemp seed, nearly dry, with a thin sarcocarp; the endocarp bony costate-rugous; cocci cohering. Seeds suspended from the funicle which arises from near the base of the cell; near the last, and L. hispida, *Kunth.*, but the latter species has serrato-crenate bullate-rugous leaves, and a juicy fruit.

LANTANA ODORATA, *Linn.; Schauer, l. c., p.* 603. Var. BERLANDIERI: foliis rhomboideo-oblongis acutiusculis supra scabriusculis subtus pallidioribus vix canescentibus. Ramos, Mexico, *Thurber.* (No. 3184, *Berlandier.*) Plant 1–3 feet high, slender. Leaves about an inch long. Peduncles (in Berlandier's specimens) much longer than the leaves. Flowers white.

LANTANA HORRIDA, *H. B. K. l. c. p.* 211. Var. PARVIFLORA, *Schauer, l. c. p.* 597. Near San Antonio, Texas; *Thurber.* Hills and dry prairies along the Rio Grande, also on the seacoast near Indianola; September—October; *Schott.* (No. 1511, *Wright*; Nos. 2114 and 2310, *Berlandier.*) Banks of the Escondido and near the Painted Caves; *Bigelow.* We name this plant on the authority of an authentic specimen of Berlandier's, No. 2310, which is certainly the same as ours. It is a shrub 3 or 4 feet high, often quite unarmed, and usually the prickles are sparse and extremely short. Flowers yellow, turning to a deep brown. The fruit is about the size of a peppercorn and is juicy when ripe. It may be only a variety of L. Camara.

VERBENA HASTATA, *Linn.; Torr. Fl. N. York*, 2, *p.* 51. V. hastata, *Lam. Ency.* 8, *p.* 548; *Schauer in DC. Prodr.* 11, *p.* 545. Near the Copper Mines, June—July; *Bigelow.*

VERBENA PROSTRATA, *R. Br. in Hort. Kew.* (*ed.* 2) 4, *p.* 41; *Schauer, l. c. p.* 547. Grassy places near Monterey, California; *Parry.*

VERBENA OFFICINALIS, *Linn.*; *Schauer, l. c.* Rocky places between Van Horn's Wells and Muerto, July; *Bigelow.* Seashore, near Galveston, Texas, September; *Schott.* Cañon of Guadaloupe, Sonora; *E. K. Smith.* San Diego, California; *Thurber.*

Var. HIRSUTA: incano-hirsuta, assurgens, bracteis calycem subæquantibus. Near the Copper Mines, New Mexico, June; *Bigelow.*

VERBENA CANESCENS, *H. B. K. Nov. Gen. & Sp.* 2, *p.* 274, *t.* 136; *Schauer, l. c.* V. remota, *Benth. Pl. Hartw. p.* 21. Western Texas, along the Rio Grande, and in the adjoining Mexican States. (Nos. 1496 and 1497, *Wright.* Nos. 827, 955, 1485, 2054, and 2247, *Berlandier.* No. 77, (1846,) *Lindheimer.* No. 594, *Fendler.*) Some forms of V. officinalis approach this species; and V. strigosa, *Hook. Comp. Bot. Mag.* 1, *p.* 176, seems to be hardly distinct.

VERBENA BRACTEOSA, *Michx. Fl.* 2, *p.* 14; *Scnhauer, l. c., p.* 549. Sa Diego mountains, on the Rio Grande, and sandy places, El Paso, etc.; May—October; *Bigelow, Thurber.* (No. 1499, *Wright.*)

VERBENA AUBLETIA, *Linn.; Schauer, l. c., p.* 554. V. bipinnatifida, *Schauer, l. c.* Glandularia bipinnatifida, *Nutt. Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 184; common everywhere in Western Texas, New Mexico, extending to Chihuahua and Sonora. (Nos. 1501, 1502, and 1503, *Wright.*) Flowers throughout the season. We have in vain sought for characters to distinguish the two species here united. They vary in the number and form of the segments of the leaves. The ripe nutlets are the same in both. We know of no plants which, in the wild state, are more prone to hybridize than the North American species of this genus. Dr. Engelmann has enumerated (in Silliman's Journal, vol. ?,) many intermediate forms between V. officinalis, V. hastata, V. urticæfolia, and V. stricta, which he found in the vicinity of St. Louis, Missouri.

AVICENNIA TOMENTOSA, *Jacq.; Schauer in DC. Prodr.* 11, *p.* 699. Mouth of the Rio Grande, October—November; *Schott.* Also found, many years ago, at Tampa Bay, Florida, by *Dr. Leavenworth*, and at Key West by the late *Mr. Blodgett.*

LABIATÆ.

Hyptis spicata, *Poir.; Benth. in DC. Prodr.* 12, *p.* 121? San Bernardino, Sonora, July; *Thurber.* Differs in the unequal teeth, the longer of which are not much shorter than the tube.

Hyptis lanata, *Benth. Bot. Sulph. p.* 42, *t.* 20. On the lower Gila; *Emory.* Major Rich found it also in lower California.

Mentha Canadensis, *Linn.; Benth. in DC. Prodr.* 12, *p.* 173. Banks of the Mimbres, October; *Bigelow.* California; *Shelton.*

Lycopus Europæus, *Linn.* Var. sinuatus, *Gray, Man. ed.* 2, *p.* 304. L. sinuatus, *Benth.;* L. exaltatus *&* L. sinuatus, *Ell.* River banks near San Luis Rey, California, October; *Parry.*

Monardella undulata, *Benth. in DC. Prodr.* 12, *p.* 190. Dana's Ranch, California; *Parry.*

Monardella candicans, *Benth. Pl. Hartw. p.* 330; *Torr. Bot. Whippl. Rep. p.* 123. Mountains east of San Diego, California, June; *Parry.* Also found by *Mr. Shelton.*

Monardella odoratissima, *Benth. in. DC. Prodr. l. c.* Near San Diego, California, and on the mountains east, June; *Parry.*

Monardella villosa, *Benth. Bot. Sulph. p.* 42, *t.* 21. San Felipe, California, June; *Parry.* Var. leptosiphon: foliis integerrimis vel obsolete repando-dentatis; corollæ tubo calyce duplo longiore. Stem apparently assurgent. Leaves three-fourths of an inch long, ovate, abruptly tapering at the base to a petiole which is half the length of the lamina. Bracts ovate, acute, slightly colored. Head nearly an inch in diameter, about 30-flowered. Calyx oblong-cylindrical; teeth lanceolate, acute, nearly equal. Tube of the corolla slender, a little tapering upward; segments of the limb linear, rather acute, scarcely equal. Stamens exserted; anther-cells at length so much divaricate as to be in a line and almost confluent. Differs from the ordinary form of M. villosa in being much less hairy, the leaves not crenate-serrate (as they are in our California specimens, and in the figure quoted above), the longer petioles, less crowded heads of flowers, and especially in the long-exserted tube of the corolla.

Micromeria Douglasii, *Benth. Lab. p.* 372. Pine woods near Monterey, California, May; *Parry.*

Micromeria Xalapensis, *Benth. Lab. l. c.* San Antonio, Texas, April; *Thurber.*

Calamintha glabella, *Benth. in DC. Prodr.* 12, *p.* 230. Cunila glabella, *Michx. Fl.* 1, *p.* 13. San Antonio, Texas, April; *Thurber.*

Pogogyne Douglasii, *Benth. Lab. p.* 414. Valley of the Sacramento, and frequent in other parts of California; *Fitch, Stillman, Shelton,* etc. We have never been able to distinguish satisfactorily more than one species of this genus. We have numerous forms of it, but they seem to pass into each other.

Hedeoma mollis (n. sp.): incano-tomentosa; foliis ovatis obtusis integris basi in petiolem brevem attenuatis; verticillastris 6–12-floris; floribus brevipedicellatis; calycibus cylindricis non gibbosis, dentibus brevissimis; staminibus inferioribus subexsertis, superioribus rudimentis sterilibus.—Cliffs near Puerte de Paysano, September; *Bigelow.* Plant somewhat ligneous at the base, which throws up several slender branches 12 to 15 inches in height. Leaves three-fourths of an inch long and 3 or 4 lines wide. Flowers crowded in axillary cymules. Calyx about 3 lines long, slightly curved, the teeth one-fifth the length of the tube. Corolla about as long as the calyx. Upper lip a little notched. Lower lip 3-lobed; the middle lobe emarginate; lateral ones entire. Stamens 4; the two inferior ones perfect and nearly exserted; anthers with divaricate oblong cells; upper stamens reduced to simple short filaments.

HEDEOMA PLICATA (n. sp.): suffruticosa e basi ramosa; ramis erectis pubescentibus; foliis rhombeo-ovatis utrinque acutis argute serratis crebre et eximie penninerviis subplicatis, supra scabriusculis subtus pubescentibus; corollis calyce gibboso duplo longioribus. Dry ravines near the Limpio mountains, July; *Bigelow.* (No. 464 and 1718, *Wright.*) Branches about a span high, retrorsely pubescent. Leaves mostly shorter than the internodes, 3–4 lines long, of rather a thick texture, tapering to a petiole about a line in length, the numerous straight and parallel veins very prominent underneath. Verticils 2–6-flowered, the pedicels 1–2 lines long. Calyx gibbous at the base, distinctly 2-lipped; teeth of the upper lip ovate, mucronate, half the length of the subulate ones of the lower lip. Tube of the corolla exserted, more than half the length of the calyx; upper lip 3-lobed, the middle lobe longer and emarginate; the upper lip also emarginate.

HEDEOMA DENTATA (n. sp.): annua; ramis erectis gracilibus pubescentibus; foliis petiolatis oblongo-lanceolatis acutis pauci-dentatis; venis prominulis; verticillis remotis 6–10-floris; calyce subbilabiato vix gibboso, dentibus e basi lato-subulatis inequalibus, labii superiore divergentibus. Near Santa Cruz, Sonora, September; *Thurber.* Near the Copper Mines, October; *Bigelow.* About a foot high; much branching from the base, forming a bunch about a foot in diameter; the internodes of the branches rather distant. Leaves 5 lines long, tapering at the base into a short petiole, acutely 3–4-toothed on each margin; the veins underneath conspicuous, thicker at the extremity. Verticils usually not more than 6-flowered. Calyx slightly gibbous toward the base; teeth of the lower lip nearly twice as long as those of the upper. Corolla twice as long as the calyx. Upper lip emarginate; lower 3-lobed, the middle lobe notched. Near H. Drummondi, but in that species the leaves are entire with inconspicuous nerves, and the teeth of the calyx are all connivent.

Var. *nana:* foliis minoribus late ovatis vel ovato-oblongis interdum subintegerrimis. Rocky hills of the Rio Grande, near El Paso, April—May. Plant usually from 3 to 6 inches high, much branched from the base, incano-pubescent. Leaves one-third of an inch long. Bracts subulate, shorter than the pedicels. Verticils approximated, 3–12-flowered. Calyx evidently bilabiate, gibbous; upper teeth much shorter than the lower, subulate-lanceolate from a broad base; lower teeth subulate.

HEDEOMA INCANA (n. sp.): fruticosa, ramosissima, incana; ramis erectis foliosis; foliis linearibus vel oblongo-linearibus integerrimis obtusiusculis, axillis fasciculatis; verticillastris 4–6-floris, floribus subsessilibus; calycibus oblongo-cylindricis villosissimis subaequaliter 5-dentatis. Sandy places near El Paso, April—May; *Parry, Wright & Bigelow.* (No. 1523, *Wright.*) Plant about 2 feet high with the taste and odor of sage; the branches slender, sometimes apparently assurgent, slender, hoary, like the leaves, with a minute close pubescence. Leaves about three-fourths of an inch long, sessile, tapering at the base, flat. Flowers about 5 lines in length. Calyx densely villous with long white hairs; the teeth lanceolate. Corolla more than twice the length of the calyx; upper lip notched; lower 3-lobed, the middle lobe deeply emarginate; tube short, villous in the throat. Fertile stamens 2, a little exserted; the connective very thick; the anther-cells widely divaricate below, opening upward. Abortive rudiments of the superior stamens minute. Style strongly and rather unequally 2-cleft at the summit.

Allied to Keithia, but with a different habit, and a shorter corolla than in any of the described species of that genus. In the calyx it differs from both genera. It may remain in Hedeoma for the present, but, if other species like it should be found, it may be the type of a new genus.

HEDEOMA DRUMMONDI, *Benth. Lab. p.* 308, *& in DC. Prodr.* 12, *p.* 245. H. acinoides, *Scheele in Linnœa* 22, *p.* 592? Sandy hills, Mexico, western Texas, and Chihuahua. (No. 463, 1518, 1519, and 1522, *Wright.*; No. 620, *Fendler*, N. Mex.; No. 285, fasc. II. *Lindheimer.*) This species is certainly annual, and never perennial nor suffrutescent, as Bentham supposed it to be. It is a variable plant. Sometimes it is dwarf and cespitose; the leaves are linear-oblong or ovate, and sessile with a narrow base, or with a petiole nearly as long as the lamina; the calyx is more or less hairy, and when the plant grows in shady places the tube of the corolla is about the length of the calyx, while usually it is only about half as long. H. ciliata, *Nutt. Pl. Gamb. p.* 183, is probably only a variety of this polymorphous species.

SPHACELE CALYCINA, *Benth. Lab. p.* 568, *and in DC. Prodr.* 12, *p.* 255. (TAB. XXXVII.) Near Monterey, California, May; *Parry.* A strong plant, 2–3 feet high, somewhat shrubby at the base.

SALVIA LANCEOLATA, *Willd. Enum.* 1, *p.* 37; *Benth. in DC. Prodr.* 12, *p.* 299. S. trichostemoides, *Pursh, Fl.* 1, *p.* 19. Borders of the Rio Grande in western Texas, Chihuahua, and New Mexico; west to the Copper Mines. (No. 469, 470, and 1529, *Wright;* the last a very narrow leaved form. No. 606 *β* & 608, *Fendl.*, N. Mex., the former a small state of the plant.)

SALVIA AZUREA, *Lam.; Benth. l. c. p.* 302; *Bot. Mag. t.* 1728. S. angustifolia, *Michx. Fl.* 2, *p.* 13. S. Pitcheri, *Torr. in Benth. Lab. p.* 251. S. cæsia, *Scheele, in Linnœa*, 22, *p.* 588. Common along the Rio Grande, in New Mexico. S. farinacea, *Benth.* seems hardly distinct from this species. No. 468 *Wright*, is a narrow-leaved form.

SALVIA ALBIFLORA, *Mart. & Galeotti in Bull. Acad. Brux. v.* 11. *ex Benth. in DC. Prodr.* 12, *p.* 307. In damp situations, Santa Magdalena, Sonora; *Thurber, Schott.* Plant about 3 feet high, paniculately branched above, smooth. Lower leaves 1½–2 inches long and an inch broad, on petioles an inch or more in length, acuminate, mostly acute at the base, serrate. Whorls about 6-flowered, rather closely approximate, forming long racemes, which are nearly leafless. Pedicels two-thirds as long as the calyx. Upper lip of the calyx entire; lower 2-toothed. Corolla about 4 lines long; the upper lip strongly pubescent.

SALVIA SPICATA, *Roem. & Schult. Syst. Mant.* 1, *p.* 202; *Benth. l. c. p.* 315? Apache Springs, March; *Parry.* Our plant accords with the description of Roemer & Schultes, and it appears also to be the same as S. breviflora, *Moc. & Sessé.*

SALVIA BALLOTÆFLORA, *Benth. Lab. p.* 270. S. laxa, *Benth. in DC. Prodr.* 12, *p.* 313. On the Lower Rio Grande and its tributaries, and in the Mexican States south of the Gila; common. (No. 471, 472, 1524, and 1525, *Wright.* No. 821, 1431, 2240, and 3186, *Berlandier.*) A shrubby species, 2–5 feet high, variable in the form and size of the leaves. Flowers bright purplish-blue. Our numerous specimens show a gradual transition from S. ballotæflora to S. laxa. "The plant is used as an aromatic by the Mexicans, who call it Majorano," *Schott.*

SALVIA MICROPHYLLA, *H. B. K. Nov. Gen. & Spec.* 2, *p.* 294; *Benth. in DC. Prodr.* 12, *p.* 335. Mount Carmel, near the Great Cañon of the Rio Grande; *Parry.* Dry prairies between Elm creek and Turkey creek; *Schott.* Mr. Bentham, to whom I sent specimens of this plant, says, that it is "very near S. microphylla, but the leaves are almost entire and not rugose; the calyces also are longer." It is a shrubby and apparently somewhat spreading plant. The leaves are oblong, obtuse, narrowed at the base into a short petiole, green and nearly smooth on both sides, and rarely with one or two teeth on each margin. The flowers are in terminal racemes. Corolla bright purplish-red, more than an inch long, the galea about two-thirds the length of the lower lip, and a little hairy.

SALVIA PSEUDO-COCCINEA, *Jacq.; Benth. in DC. Prodr.* 12, *p.* 343. Neuvo Leon; *Thurber.* I have specimens of what appears to be the same species, raised in the Cambridge (Mass.) botanic garden, from Texan seeds collected by Mr. Wright. Perhaps not sufficiently distinct from the next species.

SALVIA COCCINEA, *Linn. Mant. p.* 88; *Benth. l. c.* On the Rio Grande, from Laredo downward; *Schott, Dr. Edwards.* Los Nogales, Sonora; *Capt. E. K. Smith.*

SALVIA ROEMERIANA, *Scheele in Linnæa*, 22, *p.* 586. S. porphyrata, *Decaisne in Rev. Hortic.* 1854, *ex Hook. Bot. Mag. t.* 4939. Crossing of the San Pedro river, Texas, and on Live Oak creek, a tributary of the Pecos; also on mountains near the Rio Grande, in Chihuahua; *Bigelow.* Rio Mimbres, New Mexico; *Thurber.* (No. 473 and 1526, *Wright.*) This species varies greatly in the foliage. In the form represented in the *Bot. Mag. l. c.*, (which is the same as Wright's and Bigelow's from Live Oak creek,) the leaves are mostly simple, (rarely pinnatifid, with a pair of small remote segments,) broadly cordate, 1½–2 inches wide and coarsely runcinate-toothed. The description of Scheele applies to Thurber's specimens and to those collected by Bigelow in Chihuahua. It is a showy species, with large bright scarlet flowers.

SALVIA CARDUACEA, *Benth. Lab., p.* 302; *Bot. Mag. t.* 4874. S. gossypina, *Benth. Pl. Hartw. p.* 330. Near San Diego, California; *Parry.*

SALVIA COLUMBARIÆ, *Benth. l. c.; Torr. Bot. Whippl. Rep. p.* 123. San Pasqual, California, May; *Thurber.* Dry hills near San Diego, California; *Parry.* This plant is called *Chia*, by the native Californians. The seeds abound in mucilage, which is imparted to cold water, and the beverage thus obtained is much esteemed as a summer drink. *Thurber.*

SALVIA TEXANA. SALVIASTRUM TEXANUM, *Scheele in Linnaea*, 22, *p.* 585; *Torr. & Gray, Bot. Pope's Rep. p.* 169, *t.* 6. Western Texas and New Mexico, along the Rio Grande, mostly in high and dry situations. (No. 466, *Wright.* No. 1090 and 2520, *Berlandier.*) We have removed this plant to Salvia, from which it does not differ generically. It hardly accords with any of Bentham's section, but is nearest Heterosphace, from which it differs in habit and in the calyx closed by hairs.

AUDIBERTIA GRANDIFLORA, *Benth. Lab. p.* 312, *& in DC. Prodr.* 12, *p.* 359. (TAB. XXXVIII.) In woods near Santa Barbara, California, March; *Parry.* Stem herbaceous 2–3 feet high. Flowers bright crimson, large and highly ornamental.

AUDIBERTIA STACHYOIDES, *Benth. l. c.* Sandy hills, between San Diego and Monterey, March—May; *Parry, Thurber.* A common shrub in California.

AUDIBERTIA POLYSTACHYA, *Benth. l. c.* Abundant near San Diego, California, May; *Thurber.* Stem 3–4 feet high, slightly branched, bearing numerous spikes in a long terminal panicle.

MONARDA ARISTATA, *Nutt. Trans. Amer. Phil. Soc. n. ser.* 5, *p.* 186; *Benth. in DC. Prodr.* 12, *p.* 363. Between San Antonio and the Rio Grande, Texas, and from the Presidio del Norte to Laredo, April—September. A low form, which I think is M. pectinata, *Nutt. Pl. Gamb. p.* 182, was found by Dr. Bigelow at the Copper Mines, New Mexico. It is also No. 1531, *Wright.*

MONARDA PUNCTATA, *Linn.; Benth. l. c.* Sea shore near Galveston, Texas, September; *Schott.*

MONARDA FISTULOSA, *Linn.; Benth. l. c.* M. Lindheimeri, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 20. Copper Mines; July; *Bigelow.*

DRACOCEPHALUM PARVIFLORUM, *Nutt. Gen.* 2, *p.* 35; *Torr. Fl. N. York*, 2, *p.* 75; *Benth. in DC. Prodr.* 12, *p.* 400. Dry ravines, Organ mountains, April; *Bigelow, Wright.*

CEDRONELLA CANA, *Hook. Bot. Mag. t.* 4618. Near the Copper Mines; *Bigelow, Wright.* Burro mountains; *Bigelow.* Perhaps not distinct from C. Mexicana. No. 1532, *Wright*, has broadly cordate coarsely toothed leaves, which are 1½ inch long and more than an inch wide. In the specimens from the Copper Mines (No. 1533, *Wright*) the leaves are ovate or oblong, 8–10 lines long and rather sparingly toothed or almost entire. Our specimens from the Burro mountains have lanceolate leaves, of which only a few of the lowest are slightly toothed near the base.

CEDRONELLA PALLIDA, *Lindl. Bot. Reg.* 32, *t.* 29? Janos, Chihuahua, May; *Thurber.* Var. foliis ovato–oblongis basi acutiusculis. (No. 1534, *Wright.*) Differs from C. cana in the more dense and spike-like inflorescence, and in corolla being only a little longer than the calyx.

SCUTELLARIA TUBEROSA, *Benth. Lab. p.* 441; *Torr. Bot. Whippl. Rep. p.* 123. Near Monterey, California; *Parry;* and Napa county in the same State; *Thurber.*

SCUTELLARIA RESINOSA, *Torr. in Ann. Lyc. N. York*, 2, *p.* 232; *Benth. in DC.* 12, *p.* 427. S. Drummondii, *Benth. l. c.* Mule Springs, May—August; *Thurber.* Wet places near the Flounce mountains, June; *Bigelow.* Lower Rio Grande; *Schott.* Valley of the Cocospera, Sonora, September; *Schott.* Presidio del Norte; *Parry.* Plant annual, but sometimes appearing to be suffrutescent, from the base becoming woody when old. Varies in pubescence, and with the leaves entire or crenate, as well as more or less broad. S. Drummondii passes by a gradual transition to S. resinosa.

SALAZARIA, Nov. Gen.

Calyx subglobosus, inappendiculatus, breviter bilabiatus, post anthesin valde auctus, vesiculoso–inflatus, reticulatus, labiis inæqualibus integris in ore parvo confluentibus. Corollæ tubus longe exsertus, recurvato–adscendens, superne in fauce dilatatus; limbo bilabiato, labio superiore concavo apice integro, inferiore patenti–convexo apice emarginato, lobis lateralibus brevibus cum labio superiore coalitis. Stamina vix exserta: antherae ciliatae, staminum inferiorum uniloculares, superiorum biloculares cordatae. Stylus apice subulatus, indivisus. Nuculæ depresso-globosæ tuberculosæ. Cotyledones radiculæ brevi incumbentes.—Frutex ramosissimus; foliis parvis petiolatis integris; racemis paucifloris terminalibus, floribus cæruleis.

S. MEXICANA. (TAB. XXXIX.) Ravines, Chihuahua, below Presidio del Norte, near the Rio Grande; *Parry.* This remarkable plant was first discovered by Col. Frémont, in 1844, on the Rio de los Angelos, a branch of the Rio Virgen, western New Mexico; but the specimens were too much injured for description. It is a shrub 2 or 3 feet high, with numerous slender spreading or reclinate branches, which are terete and hoary, with a minute appressed pubescence. The leaves are about half an inch long, petiolate, ovate or oblong–lanceolate, acute at the base, slightly pubescent, 3-nerved; petiole 2–3 lines long. Racemes 2–6-flowered, terminating the branches. Flowers on short pedicels, as large as those of Scutellaria galericulata, which they much resemble. Calyx, at first, with entire, very obtuse and equal lips, at length very much enlarged (nearly three-fourths of an inch in diameter) and bladder-like, with a contracted orifice. Corolla nearly an inch long; the upper lip concave and incurved; lower lip dilated, the sides somewhat reflexed, much shorter than the upper lip, to which they are attached. Stamens scarcely exserted; the anthers approximated in pairs; the inferior (longer) pair with one of the cells abortive; lower pair with cordate, 2-celled anthers, the cells somewhat divaricate. Style long and filiform, not at all bifid at the summit. Nutlets depressed-globose, horizontal, nearly a line in the transverse diameter, roughened with minute tubercles. Seed conduplicate, or bent at an acute angle, so that the cotyledons are somewhat horizontal and incumbent on the radicle. One or more of the nutlets are commonly abortive.

Mr. Bentham (in the introduction to his Gen. & Spec. Labiat., p. xxix) says, that the embryo of all Labiatæ that he had examined is either straight or only slightly curved; the only exception being in Scutellaria, in which "it is curved backward in a peculiar manner." Salazaria exhibits the same peculiarity, that is, the cotyledons are incumbent. The rather short radicle is not applied close to the cotyledons, but makes an acute angle with them. This results from the flexure of the carpel itself, which commences at an early period, and at last the vertex approaches the base, as in Menispermum. The nutlets in Scutellaria are always more or less roughened with minute tubercles, or with thick scales which are imbricated retrorsely. In S. parvula there is a distinct horizontal wing, free from the tubercles, and surrounding the nutlet, thus making an approach to Periloma, in which they are narrowly 4-winged.

It is evident that Salazaria makes a near approach to Scutellaria, but its nearly regular and bladder-like inappendiculate fructiferous calyx, in which there is scarcely any distinction of upper and lower lip, distinguishes it sufficiently from that genus.

PHYSOSTEGIA VIRGINIANA, *Benth. Lab. p.* 504. Dracocephalum Virginianum, *Linn. Sp. p.* 828. Western Texas; *Wright.*

BRAZONIA TRUNCATA, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 47; *Benth. l. c. p.* 434. Near Austin, Texas, May; *Wright.*

MARRUBIUM VULGARE, *L.; Benth. in DC. Prodr.* 12, *p.* 453. Santa Cruz, Sonora, May; *Capt. E. K. Smith.* Doubtless introduced by the Spaniards.

STACHYS COCCINEA, *Jacq.; Benth. in DC. Prodr.* 12, *p.* 467. Near the San Pedro river and in other parts of Sonora; also in Chihuahua; *Thurber.* Tubac, Sonora, March; *Parry.* Copper Mines, New Mexico, August; *Bigelow.* (No. 1527, *Wright.*) Our plant is smoother than the ordinary of the species. We have specimens of a Stachys, collected by Dr. Bigelow in rocky places near the Limpia mountains, which we think is a variety of S. coccinea, but the flowers are much smaller.

STACHYS AGRARIA, *Cham. & Schlecht. in Linnæa*, 5, *p.* 100; *Benth. l. c. p.* 479. S. umbrosa, *Scheele in Linnæa*, 22, *p.* 595. Near Santa Antonio, and in other parts of Texas; *Wright*, No. 1535.

STACHYS PALUSTRIS, *Linn.?; Benth. l. c.* Near San Diego, California, May; *Thurber.*

TRICHOSTEMA LANATUM, *Benth. Lab. p.* 659. (TAB. XL.) Solidad, above San Diego, California, June—July; *Parry;* also found near San Antonio, in the same State, by Dr. Andrews. Pubescence purplish and velvety. Stamens exserted two inches. Plant fragrant.

TRICHOSTEMA DICHOTOMUM, *Linn. Benth. l. c.* Western Texas. (No. 1541, *Wright.*)

TETRACLEA COULTERI, *Gray in Sill. Jour.* (2 *ser.*) 16, *p.* 97. (TAB. XLI.) Rocky hills on the Rio Grande, from Eagle Pass upward to El Paso; July—October. Sierra del Pajarito, June, *Schott*, and San Bernardino, Sonora, April; *Capt. E. K. Smith.* Mr. Bentham having in a recent letter communicated to me his opinion that Tetraclea is a true Labiate plant, and hardly distinct from Trichostema, Dr. Gray makes the following remarks: "Tetraclea Coulteri is most nearly allied to Trichostema, § Orthopodium, as Mr. Bentham suggests. But it differs in the equally spreading (not declined) lobes of the corolla, and the equal stamens with parallel anther-cells. If the published character of *Trichostema*, and of the order were perfectly correct, it would also differ importantly in the amphitropous descending ovule. But in Trichostema, also, the ovules are amphitropous or between that and anatropous. The seed, however, is attached below the middle, whereas in Tetraclea it is attached above the middle; but this is merely a difference of degree. The anthers are not drawn quite right in the plate. They are scarcely emarginate at the upper, but deeply lobed at the lower end, and perfectly opposite or parallel."

TEUCRIUM CANADENSE, *Linn. Benth. in DC. Prodr.* 12, *p.* 581. Santa Cruz Valley Sonora; *Schott*, *Thurber*. West of Cerralbo; *Gregg*. (No. 1542, *Wright*.)

TEUCRIUM CUBENSE, *Linn.; Benth. l. c. p.* 578. T. laciniatum, *Torr. in Ann. Lyc. N. York*, 2, *p.* 231; *Benth. l. c.* Common in plains and low places throughout western Texas, N. Mexico, Sonora, etc., June—September. (No. 1544, *Wright*.)

BORAGINACEÆ.

CORDIA PODOCEPHALA (n. sp.): ramalis teretibus subcapitatis; foliis ovato-lanceolatis obtusiusculis basi angusto-cuneatis grosse serrato-dentatis utrinque ramulisque scabro-hirsutis; pedunculis axillaribus terminalibusque elongatis erectis; capitulis globosis; calyce ovato strigoso acute 5-dentato. Near San Antonio, Texas; October; also prairies and alluvions of the Rio Grande from the San Pedro to the Pecos; *Schott*. Plains and grassy places, Piedra Pinta, Texas; September—October; *Bigelow*. Near Monterey, Mexico; *Gregg*, *Dr. Edwards*. (Nos. 456 and 1510, *Wright*.)

Plant 1–2 feet high, nearly simple or moderately branched. Leaves 1–1½ inch long, and 3–5 lines wide; 4–6-toothed on each margin; scabrous on both sides, with short appressed hairs, which commonly arise from an elevated base. Peduncles solitary in the axils, 2–6 inches long. Heads (exclusive of the corolla) about one-third of an inch in diameter; the flowers closely aggregated. Corolla funnel-form, with a short tube, half an inch long and of equal diameter; white or pale rose color; the lobes short and slightly emarginate. Fructiferous calyx somewhat enlarged, the teeth triangular-ovate. Stamens included. Style long and filiform; the apex twice 2-cleft. Ovary 4-celled, the ovules ascending. Drupe about the size of a hempseed (Canabis); pulp very thin; endocarp reticulate-pitted. Cotyledons distinctly plicate longitudinally. Apparently allied to C. patens. An undescribed species of this genus was found by Gregg in the Balson de Mapimi. It may be thus characterized:

CORDIA GREGGII, (n. sp.): ramosissima, scabro-pubescens; foliis obovatis obtusis dentatis plicato-rugosis, basi longe cuneatis; cymis contractis subcapitatis paucifloris; laciniis calycis setaceis tubo campanulato brevioribus; corolla glabra infundibuliformi-campanulata. In the northern part of the Balson de Mapimi, flowering in April. A shrub 5–8 feet high. Leaves scarcely half an inch long, of a pale greenish gray color. Peduncles terminating the leafy branches, an inch long. Cymes 8–12-flowered, the flowers at first in a dense head, but afterwards unfolding a little. The upper part of the 5–6-toothed calyx clothed with short blackish hairs. Corolla more than an inch in diameter, white; the lobes obtuse and entire. Stamens 5–6, scarcely half the length of the corolla. Ovary tapering to a long slender style. Ovules ascending. This species connects the sections Dasycephalæ and Cordiopsis. It is allied to C. parvifolia, but has a much more contracted inflorescence.

CORDIA BOISSIERI (*Alph. DC. Prodr.* 9, *p.* 478,): foliis ovatis utrinque obtusis vel apice acutiusculis; interdum serrulato-repandis supra scabriuscule pubescentis subtus velutino-tomentosis; pedunculis corymbosis rufo-tomentosis; calyce cylindraceo-ovato, dentibus subulato-acuminatis; corolla infundibuliformi calyce duplo-longiore glabriuscula. Near Monterey, Mexico; *Dr. Edwards, Gregg.* New Leon; *Thurber.* May. Cretaceous hills around Ringgold Barracks on the Rio Grande; *Schott.* (No. 304, *Berlandier.*) A shrub or small tree, sometimes attaining a height of 15 or 20 feet. Leaves 3–4 inches long, and 2–3 inches wide. Flowers in terminal corymbs. Corolla an inch and a half long, white, with a yellow centre. Stamens 5, shorter than the corolla; filaments slender; anthers oblong. Style twice bifid; the lobes obtuse, flattish. Fruit enclosed in the enlarged calyx, oblong, with a thin pulp. Endocarp thick and bony. Albumen none; cotyledons foliaceous, much plicate and veiny. The Mexicans call this plant Nacahuita. Dr. Gregg says that the fruit is eaten by cattle and hogs, and that a decoction of the leaves is used for pains in the limbs. It is closely allied to C. Sebestena, *Linn.* (C. speciosa, *Willd.*, which grows on Key West); but differs in the soft velvety undersurface of the leaves, the shorter calyx with more pointed teeth, etc.

EHRETIA ELLIPTICA, *DC. Prodr.* 9, *p.* 503. Texas; *Wright.* Near Corpus Christi; *Major Eaton.* Near Monterey, Mexico to Camargo; *Gregg.* Santa Rosa, Chihuahua; *Bigelow.* Between Ringgold Barracks and the mouth of the Rio Grande; *Schott.* September. (Nos. 233, 236 and 900, *Berlandier.*) A tree 20–30 feet high, and often nearly a foot in diameter, with gnarled branches. Flowers sometimes tetramerous. Fruit the size of a large pea, yellow, with a thin edible pulp.

PTILOCALYX GREGGII, *Torr. & Gray, Bot. Pope's Rep. p.* 14, *t.* 8. Rocky places on the Rio Grande, from El Paso to the Presidio. (Nos. 492 and 1583, *Wright.*) A shrub 1–3 feet high, with small oval leaves; remarkable for the spherical clusters of flowers and plumose calyx-segments.

STEGNOCARPUS CANESCENS, *Torr. & Gray, l. c., p* 13, *t.* 7. Coldenia? (Stegnocarpus) canescens, *DC. Prodr.* 9, *p.* 559. Dry hills near El Paso, etc., March—May. (Nos. 836, 959, 2256, 2389, *Berlandier.*)

TIQUILIA BREVIFOLIA (*Nutt. herb.*): annua; foliis ovatis, 3–4 veinis; staminibus inclusis. *Torr. in Bot. U. S. Expl. Exped. ined. t.* 12. Desert west of the Colorado, California, March; *Schott.* This plant was found by Major Emory in 1846, in the same desert; but his specimens were collected in the winter, and were too imperfect for determination. T. dichotoma, *Pers.*, (Coldenia? dichotoma *DC.*,) differs in being suffrutescent and in having lanceolate leaves. Late in the season the leaves become rigid and hispid. The remarkable character of the lobed cotyledons in this genus was pointed out to my friend Dr. Gray many years ago. It is fully described in the Botany of the United States Exploring Expedition. Mr. Bentham has noticed it in *Hook. Jour. Bot. & Kew Miscell.* 3, *p.* 296.

Var. PLICATA: foliis oblongis utrinque 5–7-veniis plicato-rugosis. With the preceding. Leaves remarkably plicate between the veins. Late in the season the stem of this becomes hard and ligneous, so that, without examining the root, the plant might be considered as frutescent.

EDDYA HISPIDISSIMA, *Torr. & Gray, Bot. Pope's Rep. p.* 170, *t.* 9. Gravelly hills near El Paso, New Mexico; March—May. (Nos. 485 and 1557, *Wright.*)

HELIOTROPIUM CURASSAVICUM, *Linn.; DC. Prodr.* 9, *p.* 538. Sandy places, especially on the banks of rivers throughout western Texas and New Mexico, and west of the Pacific; flowering from April to September. Dr. Parry found it in abundance on the beach near San Diego.

Heliotropium inundatum, *Swartz Fl. Ind. Oc.* 1, *p.* 343; *Gray & Engelm. Plant. Lindheim. p.* 18. Sandy plains, Eagle Pass, September; *Bigelow.* Near the Pecos; *Schott.* Dr. Edwards and Major Eaton found the plant near Monterey, Mexico, and Dr. Gregg at Matamoras. Alexandria, Louisiana; *Dr. Hale.* (Nos. 700, 917 and 2117, *Berlandier.* No. 1550, *Wright.*) All our specimens are evidently annual; but De Candolle has described it as fruticulose. The root does, indeed, as in many other annuals of this dry country, become quite woody late in the season. The nutlets are ovate and villous, and their face marked with 2 small ovate protuberances, but with no foveolæ.

Heliotropium phyllostachyum (n. sp.): annuum, diffuse ramosum, strigoso-hirsutum; foliis lanceolatis basi in petiolum brevem attenuatis; spicis solitariis interrupte foliaceis; floribus sessilibus; lobis calycis lanceolatis inequalibus; corollæ tubo longitudine calycis extus piloso; antheris superne attenuatis apice puberulis; nuculis subglobosis extus strigulosis intus bifoveolatis. Western Texas, No. 1551, *Wright.* We have the same plant, collected near Monterey, Mexico, by Dr. Edwards and Major Eaton, and from Key West sent by the late Mr. Blodgett. It is also No. 1538 and 3038 of Berlandier, who collected it at San Fernando, Cohahuila. Plant more or less branched and diffuse; the branches 3–5 inches long, of a grayish aspect. Leaves 6–8 lines long and 2–2½ lines wide, scabrously hirsute; the hairs arising from a little callous tubercle. Spikes many-flowered; many of the flowers ebracteate, others furnished with a large foliaceous bract which resembles the proper leaves. Flowers small: corolla apparently white, the lobes lanceolate and erect. Stamens inserted at the lower part of the corolla-tube; anthers somewhat hastate. Style very short; stigma conical from a broad base. Nutlets about half a line in diameter, with two deep pits on the face. It belongs to the section *Orthostachys.*

Heliotropium Greggii (n. sp.): suffruticosum, e basi ramosum, prostratum; foliis lanceolato-linearibus obtusiusculis pilis brevibus adpressis hirsutis; spicis paucifloris parce foliaceis bracteatis, floribus sessilibus; corolla calyce duplo longiore, limbo plicato, laciniis brevissimis; antheris apice barbulatis; stigmate superne attenuato; nuculis subglobosis hispidis facie bifoveolatis. Sandy places near El Paso, April; *Bigelow.* Near Chihuahua, August; *Thurber.* (No. 487 and 1548, *Wright.*) Valley of Conchos, near Santa Rosalia, May; *Gregg.* Boca Grande, Caracalio, March—April; *Capt. E. K. Smith.* Stems prostrate, 3–8 inches long. Leaves 6–10 lines long, rarely 2 lines wide. Spikes at first distinctly circinate, mostly few-flowered, but sometimes 15–20-flowered, irregularly foliaceous. Flowers on short pedicels, white, odorous. Corolla 3–4 lines in diameter, the limb spreading and strongly plicate; lobes short with intermediate shorter ones in the sinuses. Stamens inserted about the middle of the tube of the corolla; anthers oblong, acute, at first coherent by their villous tips, but at length distinct. Style very short; stigma with a broad truncated base and tapering upward. Carpels hispid with short erect hairs; the face contracted and marked with 2 minute foveoles. Mr. Thurber informs me that the flowers are very fragrant.

Heliotropium angustifolium (n. sp.): suffruticosum, ramosissimum, erectum, adpresso-hirsutum, incanum; foliis linearibus vel lanceolato-linearibus acutis basi angustatis; spicis dichotomis vel solitariis ebracteatis; floribus brevissime pedicellatis post anthesin patulis vel nutantibus; corollæ tubo calycem subæquante; stigmate e basi subgloboso elongato; nuculis subglobosis hispidis intus bifoveolatis. Western Texas and along the Rio Grande, south to Eagle Pass, March—October. Near Monterey, Mexico; *Dr. Edwards and Major Eaton.* (No. 480 and 1546, *Wright.*) Plant about a foot high; often several stems from one root; branches terete, slender, erect. Leaves 6–10 lines long, half a line to a line in breadth, often crowded. Spikes at first short, but in fruit 2 or 3 inches long, slightly circinate when young. Calyx a little shorter than the tube of the corolla; the lobes lanceolate, equal, erect. Corolla apparently white, about 2 lines long; lobes lanceolate, acute, spreading, or somewhat erect. Stamens inserted in the middle of the tube of the corolla; anthers oblong, smooth at the tip. Stigma elongated and narrow, from a somewhat dilated base; style as long as the ovary. Nutlets often alternately smaller, with a narrow face, which is marked with 2 distinct pits.

HELIOTROPIUM LIMBATUM, *Benth. Pl. Hartw. p.* 20, *No.* 154; *DC. Prodr.* 9, *p.* 543. Murin, Mexico; *Thurber.* San Carlos, Mexico; *Berlandier,* No. 3199. Monterey, Mexico; *Dr. Edwards and Major Eaton.* A small prostrate much branched species. Stem suffruticose. Leaves about 3 lines long, cinerous, hispid, patulous. Spikes very short, few-flowered, mixed with leaves at the extremity of the branches. Limb of the corolla much dilated and undulate, angularly 5-lobed. Anthers a little coherent and bearded at the tip. Style 3 times as long as the ovary. Stigma conical from a dilated subglobose base; bifid at the apex. This species seems to be nearly allied to H. humifusum, *H. B. K.*

HELIOTROPIUM LIMBATUM, var. CONFERTIFOLIUM: caulibus robustioribus, ramulis suberectis; foliis lanceolato-linearibus confertissimis subappressis. Plains near Leon Springs, September; *Bigelow.* San Vincente; *Parry.* Cerralvo, *Gregg.* (No. 481 and 1547, *Wright.*) This is a much stouter and larger plant than Bentham's, and differs strikingly in its narrower, somewhat appressed and crowded leaves. Flowers pale purple (*Gregg*).

HELIOTROPIUM TENELLUM, *Torr. in Marcy Report, t.* 14. Lithospermum tenellum, *Nutt. Fl. Arkans. in Trans. Amer. Phil. Soc. n. ser.* 5, *p.* 189. L. angustifolium, *Torr. in Ann. Lyc. N. York,* 2, *p.* 225, *non Michx.* (where the nutlets are incorrectly described as smooth and polished.) High plains near Howard's Springs, and Rio San Pedro, western Texas, October; *Schott.* (No. 1559, *Wright.*) Western Texas; *Marcy.* Prairies near San Augustin, Texas; *Leavenworth.* On the Red river, Louisiana; *Dr. Hale.* Tennessee; *Mr. Curry.* Plant about a foot high, often much branched. Leaves an inch long and 1–1½ line wide. Racemes few-flowered, naked or somewhat leafy; the flowers distant, conpicuously pedicellate. Calyx very unequally 5-parted; the segments lanceolate-linear, in fruit much longer than the nutlets. Corolla white, 2½ lines long; the lobes obovate-oblong and rather obtuse. Anthers oblong, slightly bearded at the tip. Stigma nearly sessile, oblong, tapering upwards, bifid at the summit. Nutlets subglobose, the upper part appressed-pubescent, below the middle (and often also above) reticulated, not verrucose as represented in the figure quoted above, without foveoles on the face.

HELIOPHYTUM PARVIFLORUM, *DC. Prodr.* 9, *p.* 553. Heliotropium parviflorum, *Linn.* Plains near Eagle Pass, September, (fruit); *Bigelow.* Lower Rio Grande, in various places, April—May; *Schott.* Monterey, Mexico; *Dr Edwards, Gregg.* We have specimens also from Key West, Florida, collected by Blodgett.

HELIOPHYTUM (CŒLOMA) MOLLE (n. sp.): suffruticosum, griseo-velutinum; foliis deltoideo-ovatis basi in petiolum abrupte angustatis margine undulatis; pedunculis terminalibus bifidis spicis conjugatis nudis scorpoideis; floribus sessilibus; calycis lobis lanceolatis corollæ tubo paullo brevioribus; corollæ lobis obtusis crenulato-undulatis: fructu subgloboso velutino apice integro, loculis in utroque segmento lateralibus lacuna magna centrale interposita. Plains near Presidio del Norte, August, fl. and fr.; *Bigelow*. Plant about a foot high, the stem a little woody at the base. Leaves alternate, 2 inches long, and an inch or more wide, clothed (like the stem) with a soft velvety pubescence, the veins underneath very distinct. Spikes 1½–2 inches long, and not much elongated in fruit, at first strongly circinate, the flowers closely approximated. Corolla about 2½ lines long, white, infundibuliform. Anthers oblong. Stigma subsessile, conical from a broad base, pubescent. Fruit about 2 lines in diameter, segments 2-seeded, with a large central lacune interposed, besides 1–2 smaller lateral ones.

HELIOPHYTUM (CŒLOMA) GLABRIUSCULUM (n. sp.): caule herbaceo erecto e basi ramoso adpresse pubescente; foliis alternis lanceolatis, obtusiusculis basi in petiolum attenuatis utrinque viridis glabriusculis; spicis solitariis geminatis vel ternatis, junioribus scorpoideis; floribus brevissime pedicellatis approximatis ebracteatis; calycis lobis lineari-lanceolatis; corollæ lobis oblongis obtusis; fructu compresso subdidymo puberulo apice integro ad suturas late excavato, segmentis dispermis, lacuna centrali interposita præterea lacunarum 2 minorum lateralium. Sandy plains, Eagle Pass, September; *Bigelow*. (No. 1549, *Wright*.) About a span high; the lower branches spreading and perhaps prostrate. Leaves an inch long and 2–3 lines wide, a little hairy on the midrib underneath, the rest nearly smooth; the margin somewhat undulate. Peduncles terminal, bearing from one to three spikes, which are about an inch in length. Corolla white, the border dilated, deeply 5-lobed; the lobes slightly undulate. Stamens inserted about the middle of the tube; anthers sessile, fixed near the middle of the back, lanceolate, acute. Stigma about as long as the subglobose ovary, nearly sessile, conical from a broad annular base. Fruit didymous, the apex truncate, concave and 4–6-denticulate; the segments sometimes only 1-seeded by abortion, with 3 empty cells, the central one (near the commissure) larger, the others lateral and much smaller.

EUPLOCA CONVOLVULACEA, *Nutt. in Trans. Amer. Phil. Soc. n. ser.* 5, *p.* 189; *Hook. Ic. t.* 651; *Torr. in Marcy's Rep. p.* 294, *t.* 15. Valley of the Rio Grande, from Presidio del Norte upwards, July—October. Chihuahua; *Thurber*. (*Wright*, No. 1553.) In the centre of each division of the fruit there is a small empty cell or lacuna, which is seen only when a cross section is made midway between the base and the apex. This genus is intermediate between Tournefortia § Arguzia, and Heliophytum.

MACROMERIA VIRIDIFLORA, *DC. Prodr.* 10, *p.* 68? Copper Mines, New Mexico, June—August; *Bigelow*, *Thurber*. (No. 1558, *Wright*.) Plant two or three feet high; erect. Stem hispid with spreading hairs. Leaves ovate, lanceolate, 2–3½ inches long, and 6–12 lines wide, the upper surface hispid with hairs which arise from an elevated callous base; the under side either hispid or somewhat softly villous with closely appressed hairs. Flowers nearly an inch and a half long, tubular-funnelform, greenish and very hairy externally; yellow inside. Calyx about one-fourth the length of the corolla; the divisions much elongated in fruit. Stamens at first included, but at length exserted. Nutlets ovate, more than a line long, smooth, and shining. Our plant agrees sufficiently well also with the description of M. viridiflora.

ONOSMODIUM CAROLINIANUM, *DC. Prodr.* 10, *p.* 70. San Antonio, Texas; *Thurber*. We have intermediate forms which seem to connect O. Virginiana and O. molle with this species.

LITHOSPERMUM CANESCENS, *Lehm. Asp.* 2, *p.* 305; *DC. Prodr.* 10, *p.* 78. Copper Mines, New Mexico, and Mountain Arroyos, near Camp Bache, June—July—August; *Bigelow*, *Thurber*.

Sierra San Luis, Chihuahua, September; *Schott.* No. 1653, *Wright,* seems to be only a narrow-leaved form of this species.

Lithospermum longiflorum, *Spreng. Syst.* 1, *p.* 554. L. incisum, *Lehm. l. c.* Pentalophus longiflorus, *DC. Prodr.* 10, *p.* 86. Banks of streams, cañon of Guadalupe, Sonora, April; *Captain E. K. Smith.* Near the Copper Mines, Ben Moore, Santa Barbara, and Mimbres, April; *Bigelow.* Apache Springs, March; *Parry.* Hueco mountains, Texas, and Ojo de Vaca, Chihuahua; *Thurber.* Nutlets ovate, white and shining, marked more or less with shallow pits. After flowering the plant becomes more branched, and produces narrower and more crowded leaves.

Lithospermum breviflorum, *Englm. & Gray, Pl. Lindh. p.* 44. Western Texas; (*Wright,* Nos. 1560 and 1561.) Nutlets as in the last.

Lithospermum Matamorense, *DC. Prodr.* 10, *p.* 76. On the Lower Rio Grande; (*Wright,* No. 1564.) Near Monterey, Mexico; *Dr. Edwards and Major Eaton.* Our plant agrees very well with Berlandier's own specimens.

Amsinckia lycopsoides, *Lehm. Del. Sem. H. Hamb.* 1831, *p.* 7; *DC. Prodr.* 10, *p.* 117. Journado between Tucson and the Gila, Sonora; also grassy places near San Diego, California, March; *Parry.*

Amsinckia intermedia, *Fisch. & Mey. Ind.* 2, *Sem. Petrop.* 1835, *p.* 26; *DC. l. c.* Alluvions of the Gila, Sonora, and near San Diego, California, March; *Parry.* The insertion of the stamens is not constant in this genus. In the same species they are sometimes placed near the base of the corolla; sometimes in the upper part of the throat. Perhaps all the species with rugose nutlets are forms of A. lycopsoides.

Eritrichium glomeratum, *DC. Prodr.* 10, *p.* 131. Myosotis glomerata, *Nutt. Gen.* 1, *p.* 112, *Hook. Fl. Bor.-Amer.* 2, *p.* 82, *t.* 162. Near El Paso and Doña Ana, March—April. (No. 1566, *Wright.*) New Mexico; *Fendler.* No. 632. About a foot high. Root perennial. Hairs of the calyx and of the upper leaves yellowish. Nutlets closely fitted to each other, forming a depressed globose fruit, margined; the back strongly rugulose transversely and more or less verrucose.

Var. hispidissimum is more hispid, and seems to be biennial. Common in New Mexico.

Eritrichium Jamesii, *Torr. in Marcy Rep. p.* 294. Myosotis suffruticosa, *Torr. in Ann. Lyc. New York,* 2, *p.* 225. Near the Copper Mines, New Mexico, and Mule Springs, March—June, El Paso, and Journado del Muerto, March—April; *Thurber.* Dry ravines, San Luis, Sonora, April; *Captain E. K. Smith.*

Eritrichium heliotropioides. Antiphytum heliotropioides, *Alph. DC. in Prodr.* 10, *p.* 122. Sandy shore of the Rio Grande at Eagle Pass; *Schott.* No. 1512, *Wright.* Valley of the Limpio; *Bigelow.* Dry plains southwest of Escondido, May, (1847,) and Saltillo, (1848 and 1849;) *Dr. Gregg.* Our specimens agree in all respects with Berlandier's. The leaves are not opposite, and we have little doubt that the plant should be referred to Eritrichium, § Rutidocaryum. The root is annual, but in old plants the stem becomes hard and ligneous.

Eritrichium (Rutidocaryum) floribundum (n. sp.): caulibus erectis basi simplicibus superne paniculatim ramosissimis foliisque adpresse cinereo-pubescentibus; foliis lanceolatis seu linearibus acutiusculis; racemis brevibus paniculatis paucifloris parcebracteatis; corolla campanulata, lobis rotundatis; nuculis late-ovatis acutiusculis densissime verruculosis. Mountains of Puerte de Paysano, September, fl. and fr.; *Bigelow.* Also in low places near Rock Creek. Root apparently perennial. Stem 2–3 feet high. Leaves 1–1½ inch long; the radical ones 3–4 lines wide, lanceolate or lanceolate-spatulate; the cauline 1–2 lines wide. Racemes lateral and terminal, forming a long, somewhat contracted panicle, 3–8-flowered, at first circinate; flowers approximated, on short pedicels. Segments of the calyx linear, somewhat hispidly pilose. Corolla white, about one-third longer than the calyx; the tube very short; border much dilated. Stamens scarcely exserted. Nutlets nearly a line long, the face acutely carinate, and a small prominence near the base, where it is attached to the style; the back strongly convex.

ERITRICHIUM PUSILLUM, *Torr. & Gray, in Bot. Pope Rep. p.* 15. Dry hills and rocky places near El Paso, March; *Bigelow, Wright.* Santa Maria, Chihuahua, March; *Parry.*

ERITRICHIUM CRASSISEPALUM, *Torr. & Gray, l. c.* Dry soils in various places along the Rio Grande, from Eagle Pass upward to El Paso, westward to Gaudalupe Pass, Sonora, March—April.

ERITRICHIUM MICRANTHUM (n. sp.): annuum, pusillum, canescenti-hispidum; caule e basi ramosissimo; foliis linearibus obtusis; racemis brevibus longe bracteatis; floribus confertis, corolla minutissima, fauce nudo; nuculis oblongis acutiusculis glaberrimis dorso convexis angulo interno prominente sulcato. Sand hills, Frontera, Texas, and in other places along the Rio Grande, March—April; *Thurber.* (*Wright*, No. 1565.) Stem 2–4 inches high, much branched from the base, and apparently diffuse when old; the branches very slender. Leaves 3–4 lines long, and scarcely more than half a line wide. . Racemes at first capitate and crowded with short leafy bracts, unfolding gradually, but never more than half an inch long, the flowers so close together as to be imbricated, with foliaceous bracts at the base longer than the calyx. Segments of the calyx linear. Corolla less than a line in length, separating early from the base, but remaining on the flower like a calyptra, the tube narrow, and about as long as the calyx; no traces of appendages; the lobes small and ovate. Stamens inserted about the middle of the corolla-tube, nearly sessile. Nutlets about one-third of a line long, narrowly oblong, shining, apparently adhering to the column (which is very broad at the base,) by the whole length of the sulcate inner angle. This species is allied to Krynitzkia, and also to the section Cryptantha of Eritrichium, differing from the first in the persistent calyx, and in wanting the appendages of the corolla, from the latter in the homomorphous flowers and smooth nutlets.

ERITRICHIUM ANGUSTIFOLIUM, *Torr. in Pacific Railroad Reports*, 5, *p.* 363. On the Rio Gila; *Thurber.* Cañon of Guadalupe Mountain, Sonora; *Capt. E. K. Smith.* The segments of the calyx are much elongated after flowering, when they become almost subulate. One of the nutlets is sometimes larger and smoother than the others. Differs from E. crassisepalum in the longer, denser, and naked racemes; in the nutlets being wholly or nearly homomorphous, oblong, and only very minutely scabrous.

ERITRICHIUM CHORISIANUM, *DC. Prodr.* 10, *p.* 130? Grassy hills near San Luis Rey, and on mountains east of San Diego, California, March—June; *Parry.* The plant from the former station is much larger, with radical leaves 3 inches long and 3–4 lines wide. Specimens laid in the herbarium give out, after some time, a purplish material, which leaves the imprint of the plant on the paper. The coloring matter is of a resinous or terebinthine nature and is quite soluble in alcohol, so that it is not a kind of indigo. It is contained in cells which are situated along the margin and on each side of the midrib. In the dried plant the color is of a bright red. We have a strong suspicion that E. Californicum, E. Chorisianum, and E. Scouleri are not distinct.

PECTOCARYA CHILENSIS, *DC. Prodr.* 10, *p.* 120. California, (the station not recorded, but probably near San Diego;) *Parry.*

KRYNITZKIA LEIOCARPA, *Fisch. & Mey. Ind.* 7, *Sem. H. Petrop.* 1841, *p.* 52. Grassy hills near San Luis Rey, February; *Parry.* Also found in California by the *Rev. A. Fitch.*

ECHINOSPERMUM DEFLEXUM, *Lehm. Asp. No* 93: Var. lobis calycinis oblongo-linearibus. Hills near the Copper Mines, New Mexico, August, fl. & fr.; *Bigelow.* This differs from my European specimens of this species in the narrower lobes of the calyx; but they are nearly as broad as those of E. secundum, *Kar. & Kir.*, which Alph. DC. refers to E. deflexum. In specimens of the latter from Altai, (collected as I think by Bunge,) the nutlets are somewhat heteromorphous, two opposite ones having rather a broad margin, which is pectinate with flat glochidiate prickles; the other two are smaller, with a much narrower margin and shorter prickles. Our plant has a biennial root. The stem more than 2 feet high. Lower leaves 2 inches long and 5–7 lines wide, villous with spreading hairs. Racemes numerous, forming a loose terminal panicle, bracteate to the summit. Pedicels closely deflexed. Corolla salver-form, 2 lines long, with a short tube and obtusely 5-lobed border; the throat furnished with 5 very prominent tubercles. Nutlets homomorphous; the aculei marginal only, in a single series, confluent at the base.

ECHINOSPERMUM PATULUM, *Lehm. Asp. No.* 95. Gravelly and sandy soils. Valley of the Rio Grande, from El Paso to Eagle Pass, and west to the Gila. Usually about a foot high, and much resembling E. Lappula.

ECHINOSPERMUM STRICTUM, *Nees. in Maximill. Trav. App.; Torr. & Gray in Bot. Pope Rep. p.* 15. E. Texanum, *Scheele in Linnæa* 25, *p.* 260. Cynoglossum pilosum, *Nutt. Gen.* 1, *p.* 114? Near San Antonio, Texas; *Thurber.* Western Texas; *Wright*, No. 1573. Nutlets with an inflexed border and a deeply depressed disk; almost as in Omphalodes. Flowers pale blue.

ERITRICHIUM PTEROCARYUM, (n. sp.,) *Torr. in Bot. U. S. Expl. Exped. t.* 13, *ined.* Hills and rocky places near El Paso, etc.; *Bigelow.* (*Wright*, No. 1570.) This species was first detected in Oregon by Dr. Pickering while connected with the United States Exploring Expedition. It is about a foot high and remarkable for its conspicuously winged fruit, the wings being as broad as the body and more or less toothed above the middle. In the Oregon specimens, and in some of those from New Mexico, one of the nutlets is apterous.

CYNOGLOSSUM GRANDE, *Dougl.; Hook. Fl. Bor.-Amer.* 2, *p.* 85. Napa valley, California, March; *Thurber.* Also found by *Mr. Fitch* in the same State.

HYDROPHYLLACEÆ.

NEMOPHILA PEDUNCULATA, *Benth. in Linn. Trans.* 17, *p.* 275? Napa valley, California; *Thurber.* This is the same as No. 480 of Coulter's Californian Collection. It is named N. parviflora by Dr. Harvey, (MSS.,) but differs from that species in the seeds being more numerous (10–13) and tuberculate, not 4, and impressed-punctate. The arillus is calyptriform in both species. The leaves, too, are usually 7–9-lobed in N. pedunculata, and only 5-lobed in N. parviflora. Alph. De Candolle (in Prodr.,) remarks that he found the placentæ 2-ovulate in both species, and Fischer & Meyer (l. c.) think they are not distinct. They may have examined a different plant from the one here noticed, probably a mere variety of N. parviflora.

NEMOPHILA AURITA, *Lindl. Bot. Reg. t.* 1601; *Alph. DC. Prodr.* 9, *p.* 290. San Diego, California; *Parry.* San Pasqual, in the same State, May; *Thurber.*

NEMOPHILA LINIFLORA, *Fisch. & Mey. Sert. Petrop. t.* 5. Dana's Ranch, and grassy plains below Los Angelos, March; *Parry.* Napa Valley, May; *Thurber.*

ELLISIA MEMBRANACEA, *Benth. in Trans. Linn. Soc.* 17, *p.* 274; *Alph. DC. l. c. p.* 292. Moist shady places, San Diego, California; *Parry.* Coulter's No. 470 is the same.

ELLISIA CHRYSANTHEMIFOLIA, *Benth. l. c.; Alph. DC. l. c.* Santa Barbara, California, and near Tucson, Sonora; *Parry.* Our specimens agree with Douglas' original ones, except that the flowers are more developed in the former than in the latter. The corolla is nearly twice as long as the calyx.

PHACELIA CIRCINATA, *Jacq. fil. Ecl.* 1, *p.* 135, *t.* 91, *& Alph. DC. Prodr.* 9, *p.* 298. Dry hills near Santa Barbara and Monterey, California, April—May; *Parry.*

PHACELIA INTEGRIFOLIA, *Torr. in Ann. Lyc. New York*, 2, *p.* 222, *t.* 3. Near El Paso, etc., March—April, and Chihuahua, August; *Thurber.* (No. 1581, *Wright.*) The specimens from these stations resemble the original plant; but others, from the Mimbres and Sonora, have the leaves more or less deeply pinnatifid and the segments often toothed, (as in No. 1579, *Wright,*) so that the specific name is not appropriate. The capsule is globose. The four seeds are oval, rough, with minute warts on the back, and the face is strongly corrugated transversely, as well as marked with a longitudinal ridge.

PHACELIA CONGESTA, *Hook. Bot. Mag. t.* 3452; *Alph. DC. l. c.* Rocky hills near Camp Bache, and near the Copper Mines, July—August; *Bigelow.* Near San Antonio, Texas, April—May; *Thurber.* Nos. 1574, and 1576, *Wright;* also, ? 1755, a dwarf form.

PHACELIA TANACETIFOLIA, *Benth. l. c.; Alph. DC. l. c.* Hills near Monterey, California, May; *Parry.* San Diego, May; *Thurber.* Var. TENUIFOLIA. P. tenuifolia, *Harv. MSS. Pl. Coult.* San Diego and other places in California, March; *Parry, Thurber.* This is surely only a slender leaved var. of P. tanacetifolia. Var. LATIFOLIA: foliis segmentis ovato-oblongis grosse dentatis. Mountains east of San Diego, June; *Parry.*

PHACELIA NEOMEXICANA (*Thurb. MSS.*): erecta, pilis patentibus pubescentia viscosa intermixtis; foliis pinnatisectis, segmentis valde inequalibus, utrinque 4–6 cum impari oblongis inciso-dentatis, lobis ovatis subdentatis acutiusculis; racemis spiciformibus densifloris corymbosis; floribus subsessilibus; lobis calycis oblongis; corolla calyce subduplolongiore campanulata, margine eroso-dentata; staminibus vix exsertis. Pine woods near the Copper Mines, New Mexico, August; *Thurber.* (No. 1577, *Wright.*) Stem 1–2 feet high, hispidly pilose and viscidly pubescent. Leaves 3–4 inches long, thin, the segments rather distant, about an inch long. Calyx not enlarged in fruit. Corolla about 3 lines in diameter, the appendages near the base with their free margins reflexed. Filaments smooth. Style hairy below. Capsule globose-ovate.

PHACELIA (EUTOCA) LOASÆFOLIA. EUTOCA LOASÆFOLIA, *Benth. l. c.* Monterey, California, May; *Parry.* Also found by Rev. Mr. Fitch, but the station not recorded. We strongly suspect this to be only P. malvæflora, *Cham. & Schlecht. in Linnæa,* 4, *p.* 494. The only discrepancy is the number of seeds said to occur in that species; but there may have been more ovules, only part of which ripened.

PHACELIA (EUTOCA) VISCIDA. Eutoca viscida, *Benth. in Bot. Reg. t.* 1808. Cosmanthus viscidus, *Alph. DC. Prodr.* 9, *p.* 296. Bushy places near Santa Barbara, California, March. "Flowers yellowish," *Parry.* Eutoca albiflora, *Nutt. Pl. Gamb.*, seems to be scarcely distinct from this species. Mr. Nuttall described from dried specimens, and was not sure that the flowers were white.

PHACELIA (EUTOCA) DOUGLASII. Eutoca Douglasii, *Benth. l. c.* Sand hills, Dana's Ranch, California, March; *Parry.* Sepals linear-spatulate. Stamens included, "dilated at the base, where they are united to the appendages of the corolla;" *Thurber, MSS.* The corolla is pale purple, not "lutescens?" as Alph. DC. supposed it to be.

PHACELIA (EUTOCA) PARRYI (n. sp.): parce hispida, pilis longis patentibus pubescentia viscosa intermixtis; foliis ovatis grosse inequaliter serratis; racemis plurifloris foliis multo longioribus; pedicellis calyce fructifero 2–3-plo longioribus; lobis calycis anguste-linearibus corolla ampla campanulata duplo brevioribus; filamentis basi squamæ corollæ adnatis; placentis 20–25-ovulatis. Mountains east of San Diego, California, June; *Parry.* Stem 1–2 feet high, apparently erect. Leaves 1–1½ inch long, tapering at the base to a petiole which is 6 or 8 lines long. Racemes at first circinate, when in fruit nearly a foot long. Pedicels about an inch in length, spreading horizontally. Segments of the calyx a little dilated upward. Corolla two-thirds of an inch in diameter, purplish, the lobes rounded and entire. Stamens scarcely exserted; the filaments with a small truncate or bidentate adnate scale at the base. Capsule ovate, rather acute, containing about 40 oblong and scabrous seeds. As remarked in the Botany of Parkes' P. R. R. Report, this species seems almost intermediate between Phacelia (Eutoca) and Whitlavia. It has the corolla of the former, with the long pedicels and corolline scales of the latter.

PHACELIA (EUTOCA) INFUNDIBULIFORMIS (n. sp.): annua, erecta, hispida, pilis rigidis patentibus pubescentia nigra viscosa intermixtis; foliis pinnatifidis, segmentis 7–9 inciso-lobatis, lobis obtusis integris vel dentatis; racemis scorpioideis plerumque bifidis multifloris, floribus congestis brevipedicellatis; lobis calycinis spathulatis; corolla semiquinquefida, lobis integris, tubo infundibuliformi; placentis 10–12-ovulatis. Overhanging rock on a mountain near Lake Santa Maria, Chihuahua, April; *Bigelow, Wright.* Plant 6–8 inches high, somewhat branching from the base. Leaves 1–2 inches long in Bigelow's specimens, somewhat longer in Wright's. Spikes 30–40-flowered, when in fruit 2½–4 inches long; the flowers very closely approximated, on pedicels a line or more in length. Calyx hispid and glandularly pubescent, the segments unequal, about two-thirds the length of the corolla, linear-spatulate, obtuse. Corolla pale purple, 2½ lines long, the tube narrower and funnel-form; lobes rounded. Stamens included, with a pair of oblique folds near the base of each filament. Style 2-cleft about half its length, hairy at the base. Fructiferous calyx nearly the length of the obtuse capsule. Seeds about 20, oval, compressed, scabrous, with an elevated ridge on the face. This species is remarkable for its funnel-form corolla, in which character it resembles the section Conanthus of Eutoca (*Alph. DC. Prodr.*); but the habit of the plant is different from that of E. aretioides. Wright's specimens have a laxer habit, as well as larger and more membranaceous leaves than Bigelow's, probably from having grown in a shady place.

PHACELIA (EUTOCA) DOUGLASII. Eutoca Douglasii, *Benth. l. c.; Alph. DC. l. c.* Sand hills, Danas' Ranch, California, March; *Parry.*

PHACELIA MICRANTHA (n. sp.): annua, erecta, gracilis, parce glanduloso–pubescens; foliis pinnatifidis, segmentis 5–9 obovatis obtusis integris vel 1–2-dentatis; petiolis marginatis basi auriculatis; racemis simplicibus vel bifidis paucifloris; calyce pedicello subæquali, segmentis obovato-oblongis obtusissimis, corolla late campanulata calyce vix longiore campanulata; placentis 8–12-ovulatis; seminibus oblongo-cylindricis incurvis transverse valde rugosis. Stony hills, near El Paso, March; *Bigelow.* Santa Cruz, near Tubac, Sonora; *Parry.* (No. 1582, *Wright.*) Plant 4–8 inches high, moderately branching. Leaves about an inch in length contracted below to a narrowly winged petiole and then dilated and auriculate at the base. Flowers distant, 1½ line in diameter, the pedicels slender and a little spreading. Calyx somewhat enlarged in fruit. Corolla pale purple; the 10 appendages minute, transversely lunate.

Seeds often 20–24, with deep transverse rugæ so as to appear articulated. A very distinct species, which was found by Dr. Bigelow, in Whipple's Expedition, as far west as the Colorado of California, but was omitted in the Botanical Report.

PHACELIA CILIATA, *Benth. l. c.* Grassy hills, San Luis Rey, California, February; *Parry.* San Diego; *Thurber,* (a large state of the plant.) Hill sides, Sonora, March; *Capt. E. K. Smith.* Ojo de Vaca, Chihuahua; *Thurber.*

EMMENANTHE PENDULIFLORA, *Benth. l. c.; Alph. DC. l. c.* San Pasqual, California, May; *Thurber.* We have also specimens of this rare plant collected by Dr. Andrews, near Monterey.

POLEMONIACEÆ.

PHLOX DRUMMONDII, *Hook. Bot. Mag. t.* 3441; *Benth. in DC. Prodr.* 9, *p.* 305. Sandy places, central and western Texas, June to September.

PHLOX SPECIOSA, *Pursh, Fl.* 1, *p.* 149; *Benth. l. c. p.* 307. P. longifolia, *Torr. in Stansbury Rep.* Gravelly hills, on the upper Rio Grande.

Var.? STANSBURYI: suffruticosa; caule superne pedicellis calycibusque glandulosa-pubescentibus; corollæ lobis oblongo-cuneatis obtusis vel emarginatis. Gravelly hills near the Organ Mountains, New Mexico; *Bigelow.* San Luis Mountain; *Capt. E. K. Smith.* Plant about a span high, much branched from a ligneous base, hairy and glandular, or the leaves and lower part of the stem nearly smooth. Teeth of the calyx scarcely as long as the tube. Corolla rose-color, the segments often a little emarginate. Style two-thirds as long as the tube of the corolla. Cells of the ovary 2-ovuled.

PHLOX TRIOVULATA (*Thurber MSS.*): canescenti-pubescens; caule erecto suffruticoso e basi ramoso; foliis anguste linearibus rigidiusculis; calycis laciniis subulatis tubo subæqualibus; corollæ tubo calyce tertio longiore, laciniis obovatis margine sæpe eroso-denticulatis; stylo ovario subæquante; loculis ovarii triovulatis. Ravines, Mule Spring; *Thurber, Bigelow.* Rio Mimbres; *Dr. Henry.* Escondido; *Parry.* Flowers from April to July. (No. 504, 1653, 1654, *Wright.*) Plant 6–12 inches high, the lower part of the stem decidedly shrubby. Leaves 1–1½ inch long, and 1–1½ line wide. Corolla white, ¾–1¼ inch in diameter. The tube nearly straight; segments varying from nearly orbicular to obovate, sometimes with a short mucro. Style and its deep divisions scarcely as long as the ovary. Ovules superimposed. This is the only species of Phlox hitherto found in which there are more than two ovules in each cell.

COLLOMIA GRACILIS, *Dougl.; Benth. l. c. p.* 308. New Mexico, Sonora, and California, March—May.

COLLOMIA GRANDIFLORA, *Dougl. in Lindl. Bot. Reg. t.* 1174; *Benth. l. c. p.* 308. Mountains east of San Diego; *Parry.*

NAVARRETIA ATRACTYLOIDES, *Hook. & Arn. Bot. Beech. p.* 368; *Benth. l. c. p.* 310. Dry places near San Diego and Monterey, California; *Parry.* San Pasqual, May, *Thurber.*

NAVARRETIA SCHOTTII (n. sp.): humilis; foliis lineari-oblongis inciso-dentatis glabriusculis, dentibus paucis patentibus integris spinescentibus; capitulis paucifloris; corollæ tubo calyce sublongiore; staminibus exsertis; ovarii loculis 2–3-ovulatis. In the Colorado Desert, Sonora; *Schott.* Plant 2 or 3 inches high, simple below. Leaves about three-fourths of an inch long, with 5–6 salient teeth on each side; the involucral ones similar in form to the others. Flowers apparently white, sessile. Segments of the calyx subulate, terminating in a long slender spine, or rather bristle. Segments of the corolla oblong, acute, mucronate. The specimens were collected very early in the season, and the more advanced state of the plant is doubtless considerably taller and more branching.

GILIA VIRGATA, *Steud. Nom.; Benth. l. c. p.* 311. Monterey, California; *Parry.* This species is certainly an annual.

GILIA GUNNISONI, *Torr. & Gray, in Pacif. Railroad Expl.* 2, (*Bot. Beckw. & Gunnis.*) *p.* 128, *t.* 9. Dry places along the upper Rio Grande and west to Sonora. (No. 1642; *Wright.*)

GILIA POLYCLADON (n. sp.): caulibus plurimis subpatulis puberulis inferne nudiusculis apice foliosis cymoso-capitatis; foliis oblongis hirsutis pinnatifido-incisis segmentis oblongis plerumque integris vel 1–2-dentatis; calycis dentibus spinuloso-acuminatis; corollæ tubo calyce subæquali, laciniis oblongis; loculis ovarii biovulatis. Stony hills near El Paso, March. Annual, stems 4–8 from one root, slender terete, somewhat spreading, simple and mostly naked, except at the summit, where they branch into a leafy cymose tuft. Leaves mostly radical, about an inch long, pinnately cut into 9–11 oblong spreading lobes, which are mostly simple. The leaves of the stem are similar to the radical, only they are smaller. Fructiferous calyx as long as the capsule. Corolla white, with a tinge of rose-color. Allied to G. inconspicua.

GILIA ACHILLEÆFOLIA, *Benth. l. c.* 311. San Isabel, California, May; *Thurber.*

GILIA CAPITATA, *Dougl. in Bot. Mag. t.* 2698; *Benth. l. c.* Common in most parts of California, from Oregon to San Diego, usually not far from the coast.

GILIA MULTICAULIS, *Benth. l. c.* Near San Diego, March; *Parry.* Perhaps only a variety of the last.

GILIA TRICOLOR, *Benth. l. c.* Napa county, California; *Thurber.*

GILIA INCONSPICUA, *Dougl. in Bot. Mag. t.* 2883; *Benth. l. c.* Sandy and stony places, banks of rivers, from the Rio Grande, particularly near El Paso, westward along the Gila to California.

GILIA INCISA, *Benth. l. c. p.* 312. Central and western Texas to the Rio Grande, also in New Mexico, Chihuahua, and Neuvo Leon. Plant 12–18 inches high. It appears to be both annual and biennial. Flowers white. The radical leaves often form a cluster, and are much less cut than the stem leaves.

GILIA RIGIDULA, *Benth. l. c.* Hill sides and rocky ravines, western Texas, New Mexico, and Sonora, March—May. (No. 1645, *Wright.*) Perennial. Plant 4–10 inches high, branching from the base, viscidly pubescent or almost glabrous. Leaves mostly simply pinnatifid, with 5–7 distant rigid and pungent segments, which vary from oblong-lanceolate to very narrowly linear. The flowers are nearly three-fourths of an inch in diameter. Corolla bright blue, yellow in the throat. Cells of the ovary with several ovules.

GILIA MULTIFLORA, *Nutt. Pl. Gamb. in Journ. Acad. Phil.* (*n. ser.*) 1, *p.* 154. Hill sides near the Copper Mines, New Mexico, August; *Bigelow.* Sonora and Chihuahua, September; *Schott.* (Nos. 1646 and 1647, *Wright:* the latter with the tube of the corolla longer.) The stem rarely branches from near the root, except when the top has been injured.

GILIA AGGREGATA, *Spreng. Syst.* 1, *p.* 626. G. pulchella, *Dougl.; Hook. Fl. Bor.-Amer.* 2, *p.* 74. Cantua aggregata, *Pursh, Fl.* 1, *p.* 147. Ravines and rocky banks of the Rio Grande, particularly near the Cibolo river; also near the Copper Mines, July—September. (No. 1650 and 1651, *Wright.*) A very ornamental plant. We have restored the older specific name of Pursh.

GILA LONGIFLORA, *G. Don, Gard. Dict.* 4, *p.* 245; *Benth. l. c.* Cantua longiflora, *Torr. in Ann. Lyc. N. York.* 2, *p.* 221 *& in Sitgr. Rep. p.* 165, *t.* 7. Common in western Texas, New

Mexico, Chihuahua and Sonora; flowering throughout the spring and summer. (No. 509, 1648 and 1649, *Wright.*)

GILIA DIANTHOIDES, *Endl. Atakt. t.* 29. Dry hills near San Diego, California, February; *Parry.* Coronados Islands, California, May; *Thurber.*

GILIA DICHOTOMA, *Benth. l. c.* Var. PARVIFLORA: floribus multo minoribus; corollis inexpansis. Cook's spring, and near Frontera, Texas, March—April; *Bigelow, Wright.* About 6 inches high. Leaves palmately 3-parted to the base; segments subulate and somewhat rigid. Corolla much smaller than in the Californian plant, and it does not seem to expand. In other respects I can find nothing to distinguish it. There are from 20 to 25 ovules in each cell of the ovary.

GILIA PHARNACEOIDES, *Benth. l. c.* Near the summit of the mountains east of San Diego, June; *Parry.*

GILIA AUREA, *Nutt. Pl. Gamb. l. c. p.* 155, *t.* 32. Copper Mines, New Mexico, April—May; *Parry.* Journado between Tucson and the Rio Gila, March; *Parry.* Ojo de Vaca, Chihuahua; *Thurber.*

GILIA LUTEA, *Steud. l. c.; Benth. l. c.; Bot. Mag. t.* 4735. Mountains east of San Diego, June; *Parry.*

GILIA ANDROSACEA, *Steud. l. c.; Benth. l. c.* Napa county, California, March; *Thurber.*

GILIA DENSIFLORA, *Benth. l. c.* Grassy places near Monterey, California; *Parry.* Not sufficiently distinct from G. grandiflora.

GILIA CALIFORNICA, *Benth. l. c.* Leptodactylon Californicum, *Hook. & Arn. Bot. Beech. p.* 369, *t.* 89. Near Santa Barbara, California; *Parry.* This species is decidedly shrubby. Dr. Antisell found it growing at Santa Inez, 3–5 feet high.

POLEMONIUM CŒRULEUM, *Linn.; Hook. Fl. Bor.-Amer.* 2, *p.* 71. Banks of the Mimbres, New Mexico, October, (in fruit); *Bigelow.* Stem 3 feet high, and, as well as the leaves glabrous. Segments of the leaves 17–21, lanceolate, acute, about an inch long. We find among our numerous specimens of this polymorphous species, some that accord very well with our New Mexican plant.

LŒSELIA GLANDULOSA, *G. Don, l. c. p.* 248. Hill sides near Mt. Carmel, Chihuahua; *Dr. Parry.* Neuvo Leon; *Dr. Edwards.* Dr. Gregg found it near Saltillo, Coahuila.

NAMA DICHOTOMA, *Choisy, Desc. Hydrol. p.* 19; *& in DC. Prodr.* 10, *p.* 182. Sandy prairies and along water courses, western Texas and New Mexico from Doña Ana to the Gulf, and westward throughout the Mexican States to Sonora and California. (No. 495, 1585 and 1586, *Wright.*) Very much branched, spreading or assurgent. Flowers pale purple, yellowish in the throat. Our plant resembles a Chilian specimen of N. dichotoma received from Dr. Arnott (which is part flowering), but differs from the description of Choisy in the corolla being half as long again as the calyx.

Var. PARVIFOLIA: caule tenui laxiuscule ramoso; foliis (semiuncialibus) obovatis obtusis basi in petiolum brevem attenuatis; floribus solitariis geminisque, pedicellis calyce dimidio longioribus. Santa Rosa, Chihuahua, January; *Bigelow.* Monterey, Neuvo Leon; *Dr. Edwards and Major Eaton.* Annual. Stem very slender, dichotomously branching, purplish. Lower leaves about half an inch long, abruptly narrowed at the base into a petiole which is less than half the lamina; upper leaves 3–5 lines long. Flowers nearly as in the larger variety.

NAMA JAMAICENSIS, *Linn. Sp. p.* 327; *Choisy, l. c.* San Antonio, Texas; *Thurber.* Sonora and Chihuahua; *Schott, Parry.* It is No. 316 of Drummond's 2nd Texan Collection.

ERIODYCTION CALIFORNICUM, *Benth. Bot. Sulph. p.* 35; *Choisy in DC. Prodr.* 10, *p.* 185. Wigandia Californica, *Hook. & Arn. Bot. Beech. p.* 364, *t.* 88. Borders of the Lower Gila and on the mountains east of San Diego, California; *Major Emory.* Near Monterey and in other parts of California; *Parry.* A shrubby plant, commonly 3–5 feet high. The leaves are variable in breadth and toothing: one of the narrow-leaved forms being E. angustifolium, *Nutt.* The flowers are rather showy and of a light purplish-blue color. The plant has a strong terebinthine taste, and abounds in a resinous matter which sometimes exudes so copiously from the stalks and leaves that in drying, the specimens stick firmly to each other and to the paper. The natives of California make an infusion of the leaves and use it as a tonic.

ERIODYCTION TOMENTOSUM, *Benth. l. c.* E. crassifolium, *Benth. l. c.* Sandy fields around San Diego, June; *Parry, Thurber.* This is a taller species than the preceding, growing from 6–8, and sometimes even 10 feet high. Like that, it is variable in the form and toothing of the leaves, and we have no hesitation in uniting the two species of Bentham here quoted. We have specimens that are intermediate, and Dr. Parry informs me, that he has seen them in California passing into each other.

FOUQUIERIACEÆ.

FOUQUIERIA SPLENDENS, *Engelm. in Wisliz. N. Mex. p.* 98; *Gray, Pl. Wright.* 1, *p.* 85, *&* 2, *p.* 63. Gravelly hills on the Rio Grande, from El Paso to the great cañon 60 miles below, April—May.

CONVOLVULACEÆ.

CONVOLVULUS LOBATUS, *Engelm. & Gray, Pl. Lindh. p.* 44. C. hastatus, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 194, *non Thurb.* C. Nuttallii, *Torr. in Emory's Rep. p.* 149. Hillsides and ravines; common in western Texas and New Mexico, along the Rio Grande; flowering through the season. Cañon of Guadalupe, Sonora; *Capt. E. K. Smith.* Near the next species.

CONVOLVULUS HERMANNIÆ, *Herit.; Choisy, l. c.* River banks and ravines; Presidio Falls, Rio Grande to Eagle Pass, March—November; *Schott, Bigelow.*

CONVOLVULUS CALIFORNICUS, *Choisy in DC. Prodr.* 9, *p.* 405. Hillsides near Monterey, California, May; *Parry.*

QUAMOCLIT COCCINEA, *Moench; Choisy, l. c. p.* 335. Magdalena in Sonora, *Thurber.* Copper Mines, August, (fl & fruit); *Bigelow.* (*Wright,* No. 1611.) The leaves in Dr. Bigelow's specimens are deeply 3-parted; the lateral divisions more or less angularly lobed at the base.

CALYSTEGIA SEPIUM, *R. Br. Prodr. p.* 483; *Choisy, l. c. p.* 433. Near San Diego, California, May; *Thurber.* C. Maximiliana, *Nees, in Maximil. Trav.* seems to be only a variety of this species.

CALYSTEGIA SOLDANELLA, *R. Br. Prodr. p.* 483; *Choisy, l. c.* Seabeach, Monterey and other places along the coast of California.

BATATUS LITTORALIS, *Choisy in DC. Prodr.* 9, *p.* 337. Convolvulus obtusilobus, *Michx. Fl.* 1, *p.* 139. Mouth of the Rio Grande and coast of the Gulf of Mexico, May; *Schott.*

IPOMŒA PANDURATA, *Mey.; Choisy, l. c. p.* 381. Wet places, near running water; western Texas, Oct.; (fl. & fr.); *Bigelow.* Leaves all entire and heart-shaped. Sepals varying from oblong to ovate, and from very obtuse to rather acute and mucronate.

IPOMŒA TENUILOBA (n. sp.): glabra; caule volubili; foliis petiolatis pedatis lobis 5–7 filiformibus integris; pedunculis unifloris petiolo subæqualibus; sepalis oblongo-lanceolatis acutis, corolla ($2\frac{1}{2}$ unciali) tubulosa, brevi-5-loba; capsula globosa glabra. Hills and rocky places near Puerto de Paysano, western Texas, September; *Bigelow.* (No. 1617, *Wright*, is a variety with the segments of the leaves broader.) Stem several feet long, twining around other plants. Segments of the leaves 1–2 inches long, usually not more than half a line wide. Peduncle with 2 subulate bracteoles at the summit, thick and mostly recurved; the pedicel about the length of the peduncle. Tube of the corolla trumpet-shaped, more than two inches long; the limb rose color.

IPOMŒA HETEROPHYLLA, *Orteg.* Pharbitis heterophylla, *Chois. in DC. Prodr.* 9, *p.* 344. Rocky hills and prairies along the Rio Grande; also on the Rio Limpio and Devil's river. (Nos. 508, 509, a very hairy form, and 1613, *Wright.*) Sepals an inch long. Corolla more than three inches long, pale rose color.

IPOMŒA NIL, *Roth.* Pharbitis Nil, *Chois. l. c.* Western Texas; *Wright*, Nos. 1037 and 1612. Magdalena, Sonora, October; *Thurber.*

IPOMŒA LONGIFOLIA, *Benth. Pl. Hartw. p.* 16 *&* 345. I. Shumardiana, *Torr. in Bot. Marcy's Rep. p.* 291. Santa Cruz valley, Sonora, July; *Thurber.* "The prostrate branches are 6–10 feet long, forming large patches which are very conspicuous in the prairies. Flowers opening in the morning, white with a purple throat," (*Thurber,*) limb nearly three inches in diameter. This differs from Captain Marcy's plant in the larger flowers, but not in other respects. After comparison with an original specimen of I. longifolia, I think it must be united with that species.

IPOMŒA PES-CAPRÆ, *Sweet; Choisy, l. c. p.* 349. I. orbicularis, *Ell. Sk.* 1, *p.* 257. Sandy shores, Brazos Santiago, Texas, May; *Schott.*

IPOMŒA COMMUTATA, *Roem. & Sch. Syst.* 4, *p.* 228. I. trichocarpa, *Ell. Sk.* 1, *p.* 258? In cultivated grounds. Rancho San Christobel, lower Rio Grande, May; *Schott.* Our specimens agree with Berlandier's No. 1931, quoted by Choisy. The species seems to be perennial. The capsule is smooth.

IPOMŒA SINUATA, *Orteg.; Choisy, l. c. p.* 362. I. dissecta, *Pursh*, non *Willd.* Convolvulus dissectus, *Linn.; Michx. Fl.* 1, *p.* 139. In shady places along the Rio Grande, from the Presidio down to Eagle Pass; August—November. A widely spread species. We have it from Monterey, Mexico, collected by Dr. Edwards and Dr. Gregg. It occurs also in the West Indies and as far south as Brazil.

IPOMŒA LACUNOSA, *Linn.; Choisy, l. c. p.* 378. Alluvions of the Rio Grande, September, October.

IPOMŒA COSTELLATA (n. sp.): herbacea, glabriuscula, ramosa; foliis petiolatis pedatim 7–9-partitis, segmentis linearibus vel spathulato-linearibus integris ciliolatis; pedunculis 1–3-floris petiolum paullo superantibus; sepalis oblongis acutis exterioribus medio subcarinatis vel ruguloso-muricatis; corolla (semi pollicari) tubulosa brevilobata; capsula glabra. On the Rio Grande, from the mouth of Pecos to El Paso, and near the Copper Mines of New Mexico; July–October. (Nos. 505 and 1615, *Wright.*) Annual. Stems, 1–5 feet long, prostrate or climbing, slender. Leaves $1-1\frac{1}{2}$ inch long, divided nearly to the base into 7–9 mostly very narrow lobes; petiole about as long as the limb. Pedicels thickened. Calyx glabrous, the exterior sepals more or less conspicuously carinate or even winged; the keel rugose-undulate, or sometimes muriculate. Corolla scarcely half an inch long, pink, the border with 5 short lobes. Style undivided; stigma capitate, two-lobed, and granulate. Capsule sub-globose, two-celled, the cells two-seeded. Seed hairy. This species is allied to I. Coptica.

IPOMŒA MURICATA (*Cav. Ic.* 5, *p.* 52, *t.* 478, *f.* 2, *ex Choisy, l. c. p.* 353): glabra; radice tuberosa globosa; caule prostrato; foliis subsessilibus palmatis, lobis 5–7 integris anguste linearibus vel lobo medio lineari-lanceolato; pedunculis unifloris brevibus (2–4 lin.); sepalis lanceolatis obtusiusculis, dorso muriculato; corolla tubulosa (unciali purpureo-coccinea) breviter 5-loba; capsula glabra. Sonora, Mexico; *Thurber*, September. (No. 1616, *Wright.*) Root a roundish tuber from half an inch to an inch or more in diameter. Stem a span long, slender. Leaves about an inch long, most of the segments scarcely half a line wide. Corolla almost trumpet-shaped.

IPOMŒA LEPTOTOMA (n. sp.): annua; caule prostrato (vix volubili) glabro; foliis petiolatis pedatis glabriusculis, lobis 5–7 linearibus ciliolatis integris, lobo medio elongato; pedunculis 1–2-floris petiolo multo longioribus; pedicellis calycibusque hispidulis; sepalis lanceolatis, apice attenuatis acutissimis; corolla campanulato-infundibuliformi (1½ unciali.) Near Santa Cruz valley, Sonora, September; *Thurber*. (No. 1614, *Wright.*) Stem branching from the root; the branches 1–1½ foot long, somewhat twining. Petioles 2–4 lines long. Leaves deeply divided in a pedate manner, the lobes scarcely a line wide, the middle lobe usually almost twice the length of the lateral ones; uppermost leaves often entire. Peduncle 1–2 inches long; the pedicels scarcely half an inch. Sepals about 4 lines long. Corolla with a bright reddish purple limb and a pale tube.

IPOMŒA FASTIGIATA, *Sweet ?; Choisy, l. c. p.* 380? On the banks and in the bed of the San Pedro, Western Texas; September, (fl. & fr.); *Bigelow*. Seems to differ in the sepals being only mucronate and scarcely aristate.

EVOLVULUS ALSINOIDES, *Linn. Sp.* 392; *Choisy, l. c. p.* 447. Rocky hills, near Camp Bache, July; *Bigelow*. Corallitas, Chihuahua, *Aug.;* and Sonora, Mexico; *Thurber*. No. 1619, *Wright*, is a form with narrow leaves.

Var. HIRTICAULIS: caule hirsuto, pilis longis patentibus; foliis ovato-oblongis, obtusiusculis. Brazos, San Jago, Texas, and on the Rio Grande near the San Pedro river, May—September; *Schott*. Western Texas, *Wright*. Monterey, Mexico; *Dr. Edwards*.

Var. ANGUSTIFOLIA: caule hirsuto, pilis sparsis longis patentibus; foliis lineari-lanceolatis, acutis. Near the Great Cañon of the Rio Grande, August; *Parry*.

EVOLVULUS? OVALIFOLIUS (n. sp.): undique velutino-sericeis; caule prostrato e basi ramosissimo; foliis ovatis (pollicaribus 6–8 lin. latis) obtusiusculis crassiusculis, basi rotundatis vel subcordatis; floribus solitariis axillaribus brevissime pedicellatis; sepalis late ovatis mucronatis; capsulis monospermis. On the Rio Grande, below San Carlos, October; *Parry*. The specimens are in fruit only.

EVOLVULUS HOLOSERICEUS β OBTUSATUS, *Chois. l. c.* E. sericeus, *Nutt. Gen.* 1, *p.* 174, *non Swartz.* E. discolor, *Benth. Pl. Hartw. p.* 6. Rio Grande, near the San Pedro river, and near Yorktown, October; *Schott*. A more densely cespitose form, with shorter branches, occurs near the Copper Mines, June; *Bigelow*. Monterey, Neuvo Leon; *Dr. Edwards*. Cerralbo; *Gregg*. The pubescence, as in the next species, is reddish, at least in dried specimens; the peduncles are only one-flowered; the sepals are scarcely two lines long, and the leaves are often more than an inch in length. It may prove to be a distinct species. The peduncles of the early flowers are sometimes nearly as long as the leaves.

EVOLVULUS ARGENTEUS, *Pursh, Fl.* 1, *p.* 187; *Choisy, l. c.* E. pilosus, *Nutt. Gen.* 1, *p.* 174, *& in Trans. Amer. Phil. Soc. n. ser.* 5, *p.* 195, non *Lamarck*. E. Nuttallianus, *R. & Schult.* Gravelly hills, near Rock Creek and Van Horne's Wells, June—July; *Bigelow, Wright*. Copper Mines, N. Mexico; *Thurber*. Chihuahua; *Gregg*. It is No. 668 of Fendler's N. Mexico

Coll. A common species on the upper Arkansas. The specific name of Pursh is inappropriate, for the hairyness is rusty-colored, and not silvery. Perhaps E. holocericeus is not distinct.

Dichondra repens, *Forst. Gen. p.* 39, *t.* 20; *Choisy, l. c. p.* 451. Var. Carolinensis, *Choisy, l. c.* D. Carolinensis, *Michx. Fl.* 1, *p.* 36. Rock Creek and Copper Mines, May—July; *Bigelow.* Santa Cruz Mountains, Sonora; *Thurber.* The leaves are commonly larger than in the plant of the southeastern States.

Dichondra argentea, *Willd. Enum. Hort. Ber. p.* 297; *Choisy, l. c.* Rocky hills on the Rio Grande, below El Paso, June—August; *Parry, Bigelow.* Chihuahua; *Thurber.* (*Wright,* No. 1621.)

Cressa Cretica, *Linn.* Var. Truxillensis, *Choisy, l. c. p.* 440. C. Truxillensis, *H. B. K. Nov. Gen. & Sp.* 3, *p.* 119. Low and sandy places. Laguna de Lache, Solado, Mexico, April; *Bigelow.* On the Gila, Sonora, June; *Thurber.* (No. 1618, *Wright.*) Saline soils, San Diego, California; *Parry.* Bolson de Mapini, Mexico; *Gregg.* Differs from our European specimens of C. Cretica, in being more upright, with considerably larger leaves and flowers, and in the linear-oblong (not roundish-ovate) anthers. The fruit, too, is mostly one-seeded. Still we follow Choisy, in regarding it as but a variety C. Cretica.

Cuscuta. Dr. Engelmann, of St. Louis, has long been occupied in preparing a monograph of this genus, which will be published on his return from Europe. Although I have his determinations of a large proportion of the species collected in the Mexican Boundary Survey, I think it better to wait until his monograph appears, and thus to have the advantages of his latest researches, rather than publish my own observations on this difficult genus.

SOLANACEAE.

Solanum Jamesii, *Torr. in Ann. Lyc. N. York,* 2, *p.* 227. *Gray, in Sill. Jour. n. ser.* 22, *p.* 284; On the upper Rio Grande; west to the Copper Mines of New Mexico and the Zuni Mountains. Rocky places, Puerto de Paysano. Tuber about the size of a marble. The specimens collected by Dr. James, in Long's Expedition, were imperfect and erroneously described as annual.

Solanum Fendleri, *Gray, l. c.* Near the Copper Mines, New Mexico; *Bigelow.* Near S. tuberosum, but differs in the segments of the leaves being nearly uniform in size; usually the lowest pair only being very small. The tubers, in the wild plant, are seldom more than half an inch in diameter.

Solanum triflorum, *Nutt. Gen.* 1, *p.* 128. On the upper Rio Grande. (No. 675 Fendl. Pl. N. Mex.) This is more common on the tributaries of the Red, Arkansas, and Missouri rivers.

Solanum nodiflorum, *Jacq. Ic. Rar.* 2, *t.* 326, *ex Dunal in DC. Prodr.* 13, *pars* 1, *p.* 46. Western Texas and on the Rio Grande from the mouth of the Limpio downward, June—July. (No. 524, 892 and 1904, *Berlandier.*) Perhaps only a variety of S. nigrum; and S. crenato-dentatum, *Dunal, l. c.* (at least the plant of Berlandier) is probably only another form of the same species.

Solanum Douglasii, *Dunal, l. c.* Moist places, San Luis Rey, California; *Parry.* Plant 8–10 feet high; flowers bright blue. Dr. Parry says that the stem is somewhat woody at the base, and that the berries are eaten by children; but it has very much the appearance of the last species.

Solanum umbelliferum, *Esch. in Mem. St. Petersb.* 10, *p.* 280; *Torr. in Whipp. Rep. p.* 127. S. Californicum, *Dunal, l. c. p.* 86. S. genistoides, *Dunal, l. c. p.* 85. S. Menziesii, *Dunal, l. c. p.* 159. In California; *Parry.* In most parts of California; but more common near the sea. It is extremely variable in the form and size of the leaves, as well as in the degree of pubescence. Being a hardy, suffruticose species, and bearing a profusion of handsome blue flowers throughout the season, it deserves a place in our gardens.

SOLANUM LINDHEIMERIANUM, *Scheele in Linnœa*, 21, *p*. 766. S. triquetrum, *B. Dunal, l. c. p*. 154. Sandy and shady places, central and western Texas, and along the Rio Grande, from the mouth of the Pecos, downward; flowering throughout the season. (No. 1591 and No. 536, the latter a narrow-leaved form, *Wright;* No. 481, *Lindheimer;* No. 154 and 1416, *Berlandier.*) Variable in the size and breadth of the leaves, as well as in the length of the auricles. This is, perhaps, too near S. triquetrum. Dr. Engelmann formerly distributed the plant under the manuscript name of S. dulcamaroides, but he published no description of it.

SOLANUM ELÆAGNIFOLIUM, *Cav. Ic. t*. 243; *Dunal, l. c. p*. 290. S. flavidum, *Torr. in Ann. Lyc. N. York*, 2, *p*. 227. S. Texense, *Engelm. & Gray, Pl. Lindh*. 1, *p*. 19. S. Roemerianum, *Scheele in Linnœa*. 21, *p*. 767. S. Hindsianum, *Benth. Bot. Sulph. p*. 39? Texas and New Mexico, especially along the Rio Grande and westward to California. (No. 1590, *Wright*. No. 659, 665 and 2069, *Berlandier.*) S. Texense differs only in being destitute of prickles; but intermediate forms are common. Dr. Gregg, who found this plant in all the Mexican States that he visited, remarks, in his notes, that the natives, who call the plant *Trompillo,* use the fruit for curdling milk, and likewise as a sudorific and sternutatory.

SOLANUM ROSTRATUM, *Dunal, Solan. p*. 234, *& in DC. Prodr. l. c*. S. heterandrum, *Pursh, Fl*. 2, *p*. 731, *t*. 7. S. Bejariense, *Moricand; Dunal, l. c*. Androcera lobata, *Nutt. Gen*. 1, *p*. 129. Nycterium lobatum, *Sweet*. N. luteum, *Donn; Torr. l. c*. Common in Texas and New Mexico, extending westward through the neighboring Mexican States. Perhaps not distinct from S. cornutum.

SOLANUM CITRULLIFOLIUM, *A. Braun in Ind. Sem. H. Frib*. 1849, fide *A. DC. Prodr*. 13, *pars* 1, *p*. 682. S. heterodoxum, *Jacq. Ecl. Pl. Rar*. 2, *t*. 103. Plains near Puerto de Paysano and near the Limpio; July—September; *Bigelow*. Flowers large, violet, an inch in diameter. The last three species belong to a remarkable group (Cryptocarpum, *Dunal,*) which Nuttall regarded as a proper genus, (Androcera.) It is chiefly distinguished by the fruit being completely inclosed in enlarged tube of the calyx.

SOLANUM HETERODOXUM, *Dunal, l. c. p*. 331? On the Rio Grande, below Presido del Norte; August; *Parry*. Corallitas, Chihuahua; *Thurber*. Differs from the last in the excessively hispid stem and branches, and in the much smaller flowers.

SOLANUM VERBASCIFOLIUM, *Linn. Sp. p*. 263; *Dunal, l. c. p*. 114. Near Monterey, Neuvo Leon; *Dr Edwards, Dr. Gregg*. Between Victoria and Tamaulipas; *Berlandier*, No. 806. A tall, suffruticose species; common in the warmer parts of America and Asia. Dr. Gregg says that the Mexicans call it *Yerba de San Pedro,* and that they use the plant made into a poultice as an application to ulcers and boils.

CAPSICUM MICROPHYLLUM, *Dunal, l. c. p*. 421. Western Mexico, Chihuahua, Neuvo Leon, etc.; common. It is used, like other red peppers, by the Mexicans, who call it *Chipatane*. The specific name is not appropriate.

PHYSALIS LOBATA, *Torr. in Ann. Lyc. N. York,* 2, *p*. 226. Solanum luteiflorum, *Dunal, l. c. p*. 64. Borders of the Rio Grande, from New Mexico to Eagle Pass, March—October. (No. 1595, *Wright.*) Dr. James collected this plant only in the early state, without fruit, except a single fructiferous calyx. We have, however, from the valley of the Rio Grande, numerous specimens of what is clearly the same species in a mature state, and which is the same as No.

1604 of Wright's Collection. The stem is 12–18 inches long, prostrate, and much branched. The leaves vary from coarsely sinuate-toothed to nearly entire. Flowers solitary, on pedicels which are much longer than the petioles. Corolla campanulate-rotate, purple, half an inch or more in diameter. Fructiferous calyx nearly as broad as long and much larger than the berry. Seeds irregular in outline, less compressed, and thicker on the edge than is usual in this genus; the testa cellular and spongy.

PHYSALIS PUMILA, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 193; Var.? SONORÆ: glabra, foliis lanceolatis integris. Fronteras, Sonora; June, *Thurber*. About a foot high; apparently erect, branching towards the summit Leaves solitary, 2–3 inches long, and 5–7 lines wide, attenuated at the base into a petiole. Flowers solitary, on pedicels which are shorter than the petioles. Segments of the calyx as long as the tube, triangular-lanceolate, acute. Corolla campanulate, yellowish, immaculate.

PHYSALIS LANCEOLATA; *Michx.* Var.? SPATHULÆFOLIA: prostrata dichotome ramosa minute pubescens; foliis spathulatis vel oblongo-spathulatis obtusis basi attenuatis solitariis vel geminis; pedunculis solitariis petiolo sublongioribus erectis; calycibus campanulatis dentibus tubo duplo brevioribus; corolla rotato-campanulata purpureo-maculata. On the sea beach near the mouth of the Rio Grande, May; *Schott*. We have a viscidly stellate-pubescent form, collected by Drummond in southern Texas, probably on the shore of the Gulf.

PHYSALIS LONGIFOLIA, *Nutt. l. c.?; Dunal, l. c.* Alluvions of the Rio Grande, 35 miles below San Elceario, and near the Copper Mines, June—July; *Bigelow*. Lower Rio Grande; *Schott*. We have also specimens collected by Lieut. Abert, on the upper Canadian, in 1846. Our plant differs from the descriptions given by Nuttall and Dunal in scarcely any respect except the narrower leaves. We have, however, only the upper part of the plant, on which the leaves (including the petiole) are rather oblong-lanceolate than ovate-lanceolate. Some of them are about 4 inches long. The root, according to Nuttall, is perennial.

PHYSALIS ALKEKENGI *β* DIGITALIFOLIA, *Dunal, l. c. p.* 438. Along the Rio Mimbres, New Mexico, May; *Thurber*. Near the Copper Mines; *Bigelow*. Sierra del Pajarito, Sonora; *Schott*. Probably, as Dunal suspects, a distinct species.

PHYSALIS MOLLIS, *Nutt. l. c.* Western Texas, and near the Copper Mines; *Thurber*. Nos. 1599 and 1600, *Wright*, seem to be only forms of this species; and 1597 a smoother form of the same. We have also specimens collected near Monterey. Flowers dull yellow, with dark purple spots at the base. It is near the preceding species.

PHYSALIS CARDIOPHYLLA (n. sp): perennis; caule petiolisque minute puberulis; foliis plerumque solitariis late cordatis grosse sinuato-dentatis longe petiolatis glabriusculis utrinque viridibus; pedicellis petiolo longioribus; calyce campanulato, dentibus tubo dimidio brevioribus; corolla (lutea) infundibuliformi-rotata immaculata. Sonora, and California, desert of the Colorado; flowers throughout the season; *Schott*. Stem 12–18 inches long, branching from the root, ascending or prostrate. Leaves ¾–1½ inch long, and nearly as broad as long, slightly succulent, sometimes nearly entire; the petiole about as long as the lamina. Pedicels mostly longer than the petioles. Calyx 2 lines long, the teeth triangular and acute. Corolla half an inch in diameter. Anthers equal, yellow. Fructiferous calyx ovate, an inch and a quarter long. Fruit the size of a small cherry. Seeds orbicular-reniform, much compressed, with a nearly even testa.

Several other species of this difficult genus are in the Mexican Boundary Collection, but they cannot at present be determined satisfactorily, either from the imperfection of the specimens, or for want of the means of comparison.

MARGARANTHUS SOLANACEUS, *Schlecht. Ind. Sem. Hort. Hal.* 1838, *p.* 8, *& Hort. Hal. p.* 1, *t.* 1; *Dunal, l. c. p.* 453. Santa Rita del Cobra, New Mexico, July—August; *Bigelow.* (No. 1603, *Wright.*) No. 1220 of Coulter's Mexican Collection. Our New Mexican specimens and those of Mr. Wright are considerably smaller than the plant represented by Schlechtendal, but his figure was taken from a cultivated specimen. Coulter's plant agrees exactly with the figure.

LYCIUM PALLIDUM, *Miers, Ill. S. Amer. Pl.* 2, *p.* 108, *t.* 67, *C.* Gravelly hills near the Rio Cibolo of the Rio Grande; also in Chihuahua and near the Copper Mines, New Mexico, April—July; *Bigelow.* (No. 760, *Fendler.*) It was also found by Frémont in 1844, on the Rio Virgen, a branch of the Colorado, western New Mexico. A shrub 3–4 feet high. Flowers greenish, larger than in any other North American species of this genus. It is remarkable for the loose campanulate calyx, the broad obtuse divisions of which are longer than the tube.

LYCIUM STOLIDUM, *Miers, l c. p.* 126, *t.* 71, *C.* On the Rio Grande, from the Presidio down to Laredo, May; *Schott.* (Nos. 540 and 1610, *Wright.*)

LYCIUM BARBINODE, *Miers, l. c. p.* 115, *t.* 68, *E.* On the upper Rio Grande and westward to the Rio Grande, March—April. A shrub about 5 feet high.

LYCIUM BERLANDIERI, *Dunal in DC. Prodr.* 13, *pars* 1, *p.* 521. Borders of the Rio Grande, from El Paso to Eagle Pass, March—April. Nos. 1604 and 1608, *Wright*, seem to be hardly distinct. A branching shrub 2–6 feet high. Flowers pale purple.

DATURA METELOIDES, *DC. MSS.*; *Dunal, l. c. p.* 544. Western Texas, Chihuahua, Sonora, and other Mexican States; common.* (No. 1606, *Wright.*)

---

* "This fine Datura, which has all the appearance of being indigenous in New Mexico and the adjacent provinces of Mexico, must be the D meteloides named by De Candolle, and described by Dunal in the Prodromus from one of the drawings by Mocino and Sesse. But the distinctions between it and D. Metel are not well stated; nor did Dunal himself identify the specie in the specimens from Berlandier's collection, No. 2156, gathered at Victoria, Tamaulipas, but referred them to D. Metel, and, in consequence, Alphonse De Candolle, in the *Geographie Botanique*, 2, *p.* 735, allows them to have considerable weight in favor of the American origin of D Metel. The only reason for doubting our New Mexican plant to be De Candolle's D. meteloides is, that Dunal described it as having a 'corolla 10-dentata,' which our plant has not. But the slight folds answering to the sinuses may have been exaggerated and misunderstood. From seeds gathered by Mr. Wright this species has been cultivated in the Cambridge Botanic Garden for several years, for the past two years by the side of Datura Metel. The leading diagnostic characters of the two may be expressed, as follows:

"D. METEL, *Linn*: viscidulo-pubescens; caule subvilloso; corollæ tubo ultra calycem sensim modice dilatato, limbo 10-dentata; basi calycis persistente subcapsula ampla.

"D. METELOIDES, *DC.*: pruinoso-glaucescens, vix puberula; flore suaveolente; corolla supra calycem cylindricum valde dilatata, limbo eximie 5-dentato; basi calycis subcapsula persistente angusta; foliis integerrimis.

"D. meteloides, although with us a lower plant than D. Metel, is more showy; its corollas (tinged with bluish purple) are more dilated-funnelform and larger, measuring 5 or 6 inches in diameter of the limb, and often 8 inches in length; and what may be called the limb is on each side equal in length to the part of the tube which projects beyond the calyx. In D. Metel the throat is much narrower, and the limb proportionally smaller, say 4 or 4½ inches in diameter. In D. meteloides there are no teeth or projections whatever at the sinuses of the corolla, nor does the slight plaiting there give the appearance of teeth; but the five proper teeth are very salient, narrowly subulate, and half an inch in length. The capsule is nearly glabrous, and with shorter prickles than the cultivated D. Metel, but otherwise similar, as are the seeds; the persistent and reflexed base of the calyx, however, is much smaller. The herbage has somewhat of the disagreeable odor of D. Metel, but the flowers are sweet-scented." *A. Gray.*

Datura Thomasii, *Torr. Bot. Pacific R. Road Rep.* 5, *p* 362. Borders of the Colorado, near Fort Yuma; *Schott.* Mr. Thurber collected at Corallitas in Chihuahua, a Datura resembling this species, but with the capsule armed with only a few (about 20) very long and rigid slightly pubescent prickles. Both may be extreme forms of D. Stramonium.

Nicotiana pandurata, *Dunal, l. c. p.* 569. Alluvions of the lower Rio Grande, Western Texas, and in the Mexican States on the west. Not very distinct from N. Roemeriana, *Scheele.* No. 630 and 3000 Berlandier's Coll. (from Matamoras) we think should be referred here.

Petunia parviflora, *Juss. Ann. Mus.* 2, *p.* 216, *t.* 47; *Miers Ill. t.* 23, *Dunal in DC. Prodr.* 13, *pars* 1, *p.* 575. Leptophragma prostrata, *Benth. in Dunal, l. c. p.* 578. Salpiglossis prostrata, *Hook. & Arn. Bot. Beech. p.* 153. Borders of the Rio Grande, lower Rio Grande and in the Mexican States westward to California. (No. 539 and 1587, *Wright.* No. 215 and 1475, *Berlandier.*)

Nierembergia (Leptoglossis) viscosa (n. sp.): viscoso-pubescens; foliis elliptis-oblongis acutiusculis basi angustatis, inferioribus longiuscule petiolatis; floribus subaxillaribus; pedicellis calyce infundibuliformi-campanulata subæqualibus; calycis laciniis oblongis acutis tubo dimidio brevioribus; tubo corollæ elongato gracili apice gibboso.—Rocky hills, mouth of the Pecos, and on Devil's river, western Texas; *Bigelow.* (No. 535, *Wright.*) Root often annual, but sometimes, apparently, perennial. Stem 6–10 inches high, usually branching from the root. Leaves 8–10 lines long and 2–4 lines wide. Pedicels often extra-axillary, shorter than the leaves. Calyx funnelform-campanulate, about four lines long. Corolla nearly an inch long, the very slender tube more than twice the length of the calyx, saccate and somewhat gibbous at the throat; limb purple, more than half an inch in diameter, rather unequally 5-lobed, the lobes roundish and entire. Stamens inserted in the succate throat of the corolla and included, two of them with short curved filaments and large roundish 2-celled anthers, 2 others with straight filaments and much smaller 1-celled anthers, the 5 stamen a mere abortive filament. Ovary ovate acute; style elongated and filiform; stigma dilated and somewhat petaloid, 2-lobed at the base, truncate and 2-lipped at the summit. Capsule much smaller than the fructiferous calyx, roundish ovate. Seeds oblong, a little curved, strongly corrugated transversely and somewhat spirally. Embryo moderately curved.

Withania? sordida, *Dunal, l. c., p.* 456. Western Texas from New Mexico to the lower Rio Grande; near Monterey, Neuvo Leon; *Dr. Edwards.* Balson de Mapini; *Gregg.* (Nos. 531, 532, 533, 1596, and 1598, the last a broad leaved form, *Wright.* No. 676, *Fendler*, N. Mex.) Perennial; villous pubescent, the pubescence partly glandular. Leaves 1–1½ inch long. Pedicels 6–10 lines long. Calyx broadly campanulate, villous; corrolla 6 lines in diameter, dull yellow. Fruit the size of a large pea.

Withania? Coronopus. Solanum Coronopus, *Dun. in DC Prodr.* 13, *pars* 1 *p.* 64. Along the Rio Grande and its tributaries, from El Paso to Laredo, April—July. (Nos. 534, 1593, and 1594, *Wright.* Nos. 74 and 480, Coll. 1846, and 484, Coll. 1847–8, *Lindheim.* No. 675, *Fendl.*, N. Mex. Nos. 666 and 3023, *Berlandier.* No. 1252, *Coult. Mex.*) Root annual? Plant roughish with minute short and thick hairs, which are bifurcate at the summit. Leaves lanceolate, 1–1½ inch long, more or less deeply pinnatifid or merely toothed, the upper part often linear and entire. Flowers solitary, on slender pedicels which are at length reflexed. Corolla dull yellow, about 6 lines in diameter. Fruit globose, the size of a large pea, nearly white when mature, about two-thirds covered with the calyx. This plant is certainly a congener of the last, which we have followed Dunal in referring doubtfully to Withania. The calyx increases with the fruit, but never encloses it, nor does it become inflated. The corolla is much more rotate than campanulate.

NIEREMBERGIA ANOMALA, *Miers in Hook. Lond. Jour. Bot.* 5, *p.* 175, *& Ill.* 1, *t.* 20; *Dunal, l. c. p.* 588, Leucanthea Roemeriana, *Scheele in Linnæa* 25, *p.* 250. Bouchetia erecta, *DC. MSS.; Dunal, l. c.* Western Texas; *Wright.* Near Monterey, Neuvo Leon; *Dr. Edwards.* (No. 345 Coll. III, Texas, *Drummond.*) This corresponds exactly with the figure of Miers, who states that the Texan plant differs in no respect from the South American N. anomala. Stamens sometimes only 4 and subdidynamous, or when 5 one of them smaller. Seeds roundish, reticulate.

BROWALLIA (LEPTOGLOSSIS) TEXANA (n. sp.): annua, vicoso-pubescens; caule e basi ramoso erecto; foliis alternis integerrimis basi in petiolum attenuatis; floribus extra-axillaribus ad apices ramorum laxe subcymosis; pedicellis calyce campanulato-tubuloso subinflato subæqualibus; corollæ tubo gracili apice subgibboso calyce triplo longiore, limbi laciniis orbicularis subæqualibus. Near the mouth of the Pecos, September—October; *Bigelow, Pope.* (No. 535, *Wright.*) Plant a span high, dull green; leaves about three-fourths of an inch long, rather acute. Pedicels 3–5 lines long. Calyx 5-cleft; the lobes ovate and acute. Corolla salver-form; the tube very slender, 8 lines long, gibbous at the summit; limb flat and somewhat oblique, 6 lines in diameter, purple. Stamens inserted in the throat of the corolla, didynamous. Capsule globose-ovate, scarcely one-third the length of the fructiferous calyx; the valves at length bifid at the summit. Seeds irregularly oblong, strongly rugous transversely. Embryo a little curved. This plant clearly belongs to Leptoglossis of Bentham, and is nearly related to L. Schwenkioides. We think the genus should be united to Browallia. We are also disposed to adopt the views of those botanists who would remove the tribe Salpiglossideæ from Scrophulariaceæ to Solanaceæ; but we are not prepared to go so far as to unite these plants and certain tribes of the latter family into an intermediate order. The limits of these orders can not yet be fixed with any degree of precision.

GENTIANACEÆ.

FRASERA SPECIOSA, *Dougl. MSS.*; *Hook. Fl. Bor.-Amer.* 2, *p.* 66, *t.* 153. Copper Mines, New Mexico, and near the Rio Mimbres, June; *Bigelow.* Capsules slightly compressed, contrary to the valves; 40–50-seeded.

FRASERA PARRYI (*Torr. in Pl. Whippl. p.* 126): caule erecto tereti glabro; foliis caulinis oppositis ternisve lanceolatis undulatis, floralibus (bracteis) ovatis pedicellis multo brevioribus; sepalis ovatis albo-marginatis; petalis ovato-lanceolatis sepala subæquantibus, fovea lunata solitaria, corona obsoleta. Mountains east of San Diego, California, on the eastern slope, June; *Parry.* No. 558, California, *Coulter.* Stem 2–3 feet high. Radical leaves clustered, the upper cauline ones mostly ternate, the whorls remote. Flowers numerous, in a terminal panicle nearly an inch in diameter. Petals greenish white, speckled with purplish linear dots; the pit or gland lunate, with the horns pointing upward, fringed with hairs around the margin. Corona a mere narrow, slightly ciliate border. Fruit not known. Nearly allied to F. Carolinensis, but that species has the leaves in 4s and 5s, a leafy panicle, linear lanceolate sepals, and roundish-oval entire glands.

ERYTHRÆA CHIRONIOIDES. Gyrandra chironioides, *Griseb. in DC. Prodr.* 9, *p.* 44. (TAB. XLII.) On the Rio Grande, from Doña Ana southward to San Elceario, and westward to the valley of the Gila. (No. 3191, *Berlandier.*) Our plant has usually broader leaves than those of Berlandier's specimens. Var. β: floribus lateralibus breviter pedicellatis; corollæ laciniis obtusis. E. Muhlenbergii, *Griseb. l. c.*, (quoad pl. Calif.) Dry soils around San Diego and in many other parts of California. It begins to flower when scarcely an inch high, but at length, in good soil, attains the height of a foot or more. The flowers vary greatly in size, from less than an inch to an inch in diameter. They are of a bright rose color with a yellow centre. We refer here E. Muhlenbergii, *Benth. Pl. Hartw.*, apparently a mere dwarf, small-flowered state of the plant, which we have from several collectors. This species is known in California by the name of *Canchalagua*, a bitter tonic of considerable reputation; but E. tricantha is often confounded with it, and possesses similar virtues. The same name has long been applied to E. Chilensis. Gyrandra speciosa, *Benth. Bot. Sulph. p.* 127, *t.* 45, differs from this species chiefly in the shorter filaments, and in being more spreading. I have noticed at least in one species that the filaments increase in length after flowering, as do the tube of the corolla and the style. In authentic specimens of Berlandier, (whose plant is certainly annual, not as stated by Grisebach, perennial,) the stem is 4-angled, as in all the species of Erythræa. The genus Gyrandra seems to have no characters by which it can be distinguished from Erythræa. The segments of the calyx are somewhat carinate, but not winged as in some genuine Erythræa. The corolla is of the same form in both genera. The anthers of E. Centaurium, as well as of other species that I have examined, are as destitute of a connective as are those of Gyrandra.

ERYTHRÆA TEXENSIS, *Griseb. Gent. p.* 139, *& in DC. Prodr. l. c., p.* 58. Rocky places on the Pecos; *Bigelow;* and along the Rio Grande; *Schott.* April—September.

ERYTHRÆA BEYRICHII, *Torr. & Gray, Fl.* 2, *p.* —, (*ined.;*) *Torr. in Bot. Marcy's Rep. p.* 291, *t.* 13. E. tricantha, β angustifolia, *Griseb. in DC. l. c.* 60. Rocky banks of the Pecos and San Pedro; *Bigelow*, etc. Sabina creek, Texas; *Thurber.* (No. 1662, *Wright.*)

ERYTHRÆA TRICANTHA, *Griseb. Gent. p.* 146, *and in DC. Prodr.* 9, *p.* 60; *Benth. Pl. Hartw. p.* 322. In various parts of California, especially near the coast. We have from Sir William Hooker specimens of this plant, collected by Douglas, which agree in all respects with ours. The lobes of the corolla are not "linear and very acute," but lanceolate and rather obtuse. Grisebach probably drew his description from specimens which were dried without pressure, so that the lobes of the corolla had become involute and apparently very narrow as well as acute. After a careful comparison of original specimens of E. tricantha and E. floribunda, (the California plant of *Benth. Pl. Hartweg,*) I have little doubt that they are forms of one species. E. floribunda differs only in the broader lobes of the corolla.

GENTIANA DETONSA, *Fries. Griseb. in DC. Prodr.* 9, *p.* 101; *Torr. Fl. N. York*, 2, *p.* 108, *t.* 82. Babacomori to Santa Cruz, in wet places, September; *Thurber.* (No. 1658, *Wright.*)

GENTIANA AFFINIS, *Griseb. in Hook. Fl. Bor.-Amer.* 2, *p.* 57. Hills and rocky places near the Copper Mines, August—October; *Bigelow.* (No. 1657, *Wright.*)

GENTIANA QUINQUEFLORA, *Lam. Dict.* 2, *p.* 643; *Griseb. l. c.* Western Texas. No. 1659, *Wright.*

EUSTOMA RUSSELIANUM, *G. Don, Gen. Syst. Gard.* 4, *p.* 175; *Griseb. in DC. Prodr.* 9, *p.* 51. Valley of the Rio Grande, etc., in sandy soils; common, May—October; *Thurber.* On the Gila, Sonora; *Thurber.* (No. 1660, *Wright.*) Leaves varying from oblong and obtuse to narrowly lanceolate and acute. The flowers also vary greatly in size and in the proportionate length of the segments and tube of the corolla Perhaps not distinct from E. exaltatum.

SABBATIA CAMPESTRIS, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 197. Prairies on the Guadalupe river, Texas, May—June; *Wright.* (No. 2568, *Berlandier.*)

APOCYNACEÆ.

Echites macrosiphon (n. sp.): caule erecto suffruticoso; ramis tomentosis; foliis ovatis acutis vel acutiusculis brevissime petiolatis basi obtusis vel subcordatis supra pubescentibus subtus albo-tomentosis; pedunculo terminali uni-(raro bi-) floro petiolo subduplo longiore; lobis calycinis lineari-lanceolatis; corollæ puberulæ tubo calyce 6–8-ies longiore versus apicem ventricoso, lobis obovatis. (Tab. XLIII.) Hills and dry rocky places along the Rio Grande, in Texas and Chihuahua, August—September. (Nos. 556, 557, and 1664, *Wright*) Plant 1–3 feet high, often a little branching at the summit. Leaves ¾–1½ inch long, and ½–1 inch wide, often obtuse, but usually with a short abrupt point, the petioles scarcely more than a line in length. Flowers of a spicy odor. Calyx with numerous (30–40) minute subulate glands on the inside surrounding the base of the corolla. Corolla white, tinged with rose externally; the tube 3–5 inches long, the upper part, for about an inch, 3 times the diameter of the lower portion, not constricted at the throat, pubescent inside below the insertion of the stamens. Nectary of 5 unequal obtuse compressed distinct glands, which are about half the length of the ovary. Follicles about 3 inches long, very slender and tapering to a long point. Seeds oblong-linear; testa wrinkled; the coma at each end longer than the body of the seed. Very much resembles E. hypoleuca, *Benth*; but that has longer peduncles, a velvety-pubescent corolla, the tube of which is only twice the length of the lobes and dilated about one-half its length as well as constricted at the orifice; also two of the glands of the nectary are connate.

Echites brachysiphon (n. sp.): caule erecto suffruticoso, ramis puberulis; foliis oblongis ovatisve acutis utrinque pubescentibus subconcoloribus brevi-petiolatis; pedunculis terminalibus unifloris petiolo 5-plo longioribus; lobis calycinis oblongis; corollæ tubo calyce 4-plo longiore supra medium subventricoso, lobis obovatis. Arroyo de los Janos and San Bernardino, Sonora; *Schott*, *Thurber*. (No. 1665, *Wright.*) Plant from a span to a foot high, more spreading than the preceding. Leaves about an inch long, sometimes smaller and oblong-lanceolate, the lower ones often obtuse, not white on the under side. Peduncles ¾ of an inch long. Calyx 2½ lines long, with about 20 minute subulate glands at the base. Corolla white; the tube an inch and a quarter long, the lower half much contracted. Nectary with two of the glands united into one. This species also is related to E. hypoleuca, but that differs in the under part of the leaves being clothed with a dense white tomentum, and the segments of the calyx are much narrower as well as longer.

Apocynum cannabinum, *Linn. Sp. p.* 311; *Alph. DC. Prodr.* 8, *p.* 439. Western Texas, Sonora, and California. Broad and narrow leaved forms occur in all these places.

Amsonia tomentosa, *Torr. & Frêm. in Frêm.* 2*d Rep. p.* 316. Sandy plains and ravines, borders of the Rio Grande, Chihuahua, Sonora, &c , April—May. Stems about a foot and a half high, several springing from a woody base. Leaves varying in breadth from linear to lanceolate, clothed with a short dense and more or less hoary pubescence. Flower about as large as in A. Tabernæmontana, *Walt.* Pods 2–3 inches long and 2 lines in diameter, cylindrical, erect. A variety, or perhaps distinct species, occurs at Laguna Santa Maria, Chihuahua. It is glabrous; the flowers are considerably smaller, with the sepals glabrous and nearly as long as the tube of the corolla. In A. tomentosa the sepals are hairy and scarcely half as long as the tube of the corolla. A Tabernæmontana differs in the very short lanceolate sepals, which are scarcely one-fourth the length of the tube of the corolla.

AMSONIA TABERNÆMONTANA, *Walt. Fl. Car. p.* 98; *Decaisne in DC. Prodr.* 8, *p.* 385. A. ciliata, *Walt. l. c.; Decaisne, l. c.* A. latifolia, *Michx. Fl.* 1, *p.* 121. A. angustifolia, *Michx. l. c.* A. salicifolia, *Pursh, Fl.* 1, *p.* 184. A. tristis, *J. E. Smith in Rees' Cycl.* Hills near the Blanco river, Texas; *Wright.* A nearly glabrous variety.

AMSONIA LONGIFLORA (n. sp.): glabra; caule erecto e basi lignoso ramosissimo; foliis lineari-lanceolatis vel linearibus; corollæ tubo gracili elongato (1½ unc. longo) superne subventricoso; sepalis lanceolato-subulatis. Rocky ravines near El Paso, April—May. (No. 1668, *Wright.*) Plant 1–2 feet high. Leaves 1½–2 inches long, and from less than a line to 2½ lines wide. Corolla blue; lobes of the limb about one-fourth the length of the tube. Pods as in the two preceding species. No. 1671 Wright is a variety with very narrow leaves, which are scabrous with short hairs on the margin.

HAPLOPHYTON CIMICIDUM, *Decaisne in DC. Prodr.* 8, *p.* 412? In crevices of rocks, Magdalena, Sonora; *Thurber, Schott.* (No. 1666, *Wright.*) Stems several from a woody base, 1–2 feet high, minutely pubescent. Leaves 1–1½ inch long, and 2½–4 lines wide, opposite or alternate, scabrous with short rigid hairs, which stand on a swollen crustaceous base. Flowers terminal solitary or 2–3 in a cymule. Calyx ⅔ the length of the corolla-tube; no traces of glands. Corolla sulphur-yellow, somewhat salverform; the tube shorter than the obovate lobes. Stamens united about middle of the tube of the corolla; anthers oblong, rather acute, rather longer than the free portion of the filaments. Ovaries oblong, distinct, each 7–8-ovuled; style rather stout. Stigma oblong-capitate, entire. Pods 2 inches long, very slender, tapering to a long narrow point. Seeds oblong-linear, the testa wrinkled, each extremity furnished with a coma of white hairs, which are longer than the body of the seed. This genus was founded on a Mexican plant; and part of the character, especially what relates to the seed, is drawn from an unpublished figure of Mocino and Sesse. Notwithstanding the seed is said to be hairy only at the upper extremity, I strongly suspect that the coma of the lower end had become detached, as it is very deciduous. Our plant agrees in every respect with H. cimicidum, except that the latter is said to have leaves 2–2½ inches long and 8–10 lines wide.

ASCLEPIADACEÆ.

METASTELMA BARBIGERUM, *Scheele in Linnæa*, 21, *p.* 760. Hill sides and thickets, borders of the Rio Grande, from New Mexico to Eagle Pass, June—September. Near Monterey, Neuvo Leon, *Dr. Edwards.* (No. 549 and 1676, *Wright.* No. 2172 and 3198, *Berlandier.*) Dr. Gregg collected it in Neuvo Leon, west of Cerralbo. We have what appears to be M. Schlechtendalii, *Dne*, collected in Key West, Florida, by the late Mr. Blodgett.

METASTELMA? ANGUSTIFOLIA (n. sp.): glabrata; caule prostrato vix volubili; foliis anguste-linearibus acutis basi in petiolem brevem attenuatis; floribus plerumque solitariis axillaribus oppositis breve pedicellatis; corollæ laciniis lineari-lanceolatis acutissimis apice recurvis introrsum infra medium retrorsim pilosis; coronæ stam. foliolis oblongo-spathulatis erectis integris gynostegio constricto subæqualibus; stigmate longe rostrato.—Sides of ravines, Santa Cruz, Sonora; *Wright*, No. 1677. Stem 1–3 feet long, slender, with a somewhat ligneous base. Leaves 1–1½ inch long and one line wide. Flowers purplish, 2 lines long, on pedicels of the same length. Calyx deeply 5-parted, the segments narrowly lanceolate. Corolla subcampanulate, the long segments recurved above the middle. Horny margins of the anthers angularly projecting; the membranaceous summit elongated, erect, oblong. Stigma with a cylindrical beak, which is somewhat longer than the erect anther-membrane. Pods not seen. We refer this plant to Metastelma with much doubt, but there is no other genus to which it seems to be more allied. It occurs also in Lindheimer's Texan Collection.

ROULINIA UNIFARIA, *Engelm. MSS.* Gonolobus unifarius, *Scheele in Linnæa*, 21, *p.* 760. Shady thickets, near the Rio Grande, western Texas and New Mexico, July—October; *Schott, Bigelow.* (Nos. 546 and 1672, *Wright.*) I fear that it is too near *R. Jacquini.*

ACERATES VIRIDIFLORA, *Ell. Sk.* 1, *p.* 317; *Decaisne in DC. Prodr.* 8, *p.* 522. Asclepias viridiflora, *Pursh, Fl.* 1, *p.* 181. Western Texas; *Bigelow.* No. 1693, *Wright*, is a variety with broadly obovate and emarginate leaves. In my Flora of the Northern and Middle States (2, *p.* 182) I incorrectly referred Asclepias obovata, *Ell.*, to this variety; a mistake which has been copied by Decaisne. Elliott's plant is a genuine Asclepias; but A. obtusifolia *β*, *Torr.*, also referred by Decaisne to A. obovata, is our A. Jamesii, described below.

ACERATES DECUMBENS, *Decaisne, l. c.* Anantherix decumbens, *Nutt. l. c. p.* 202. Valley of the upper Rio Grande and westward to the Gila river, April—August.

ACERATES AURICULATA (*Engelm. MSS.*): "caule erecto glabro; foliis sparsis linearibus filiformibus; umbellis pluribus axillaribus multiflorus breviter pedunculatis; pedicellis pilosis, calyce extus villoso; corollæ laciniis reflexis; cucullis gynostegio globoso sessili brevioribus apice leviter tridentatis margine involutis basi latissime biauriculatis; folliculis lanceolatis longe rostratis brevibus." Dry ravines near the Copper Mines, and along the Mimbres, June—July; *Bigelow.* Stem 2–3 feet high, somewhat glaucous. Leaves slightly scabrous on the margin, which is not revolute, 4–6 inches long, ⅓–½ line (rarely as much as a line) wide. Pedicels 6 lines long. Lobes of the corolla 2½ lines long. Horny wings of the anthers rounded, not angular as in most Asclepiadeæ. Pollen-masses also, of an unusual shape, curved, nearly equally wide, and obtuse at each end: remarkable, also, for the large triangular wings at the sides of the hoods. Pods 3 or 4 inches long. Resembling A. angustifolia, but easily distinguished by the perfectly smooth stem and non-revolute leaves, but especially by the larger flower, the peculiar structure of the cuculli, and the shape of the pollen-masses. This is No. 706 of Fendler's New Mexican Collection, and No. 1687 of Wright's. It was found also by Frémont on the upper Arkansas. Doubtless it has often been confounded with A. angustifolia.

ACERATES (ANANTHERIX) TOMENTOSA (n. sp.): albo-lanata; caule erecto simplici; foliis ovatis acutis sessilibus basi rotundatis v. cordato-amplexicaulibus; umbellis sessilibus plurifloris; gynostegio sessili; cucullis suborbicularis saccatis apertis lateraliter compressis. (TAB. XLIV) Mountains east of San Diego, California, June; *Parry.* San Isabel, in the same State; *Thurber.* We have also specimens collected by the Rev. Mr. Fitch, in some part of California. Stem 2–3 feet high. Lower leaves 4–5 inches long, and nearly 3 inches wide, usually clasping at the base. Umbels 3–4, in the axils of the upper leaves, 8–12-flowered; pedicels 1–1½ inch long, very densely clothed with white wool. Flowers a third larger than in Asclepias Cornuti, "of a chocolate-purple color." (*Parry.*) Petals ovate, reflexed, woolly externally. Hoods of the crown nearly orbicular, spreading, without any trace of a spur, the margin of the orifice entire and introflexed. The horny wings of the anthers almost rectangular at the base. Follicles oblong-lanceolate, downy. This is a remarkable species, belonging rather to the subgenus Anantherix than to Acerates proper.

SARCOSTEMMA BILOBUM, *Hook. & Arn. Bot. Beechey, p.* 317. S. cynanchoides, *Decaisne, l. c. p.* 540. S. Texanum, *Engelm. MSS.* Gonolobus cynanchoides, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 43. Borders of the Rio Grande, from Presidio del Norte to Eagle Pass, June—October;

Parry, Schott. Valley of the Limpia; *Bigelow.* Sonora; *Thurber.* (No. 1680, *Wright.* No. 904, 1951, and 2334, *Berlandier.*) This slender vine climbs trees to the height of 30 or 40 feet, or trails over shrubs and other plants. The flowers have an agreeable odor. I strongly suspect this to be the Gonolobus viridiflorus, *Nutt.* (not of *Roem. & Schult.*) It is certainly the plant so named in my account of the plants collected by Dr. James in Long's Expedition, and, I think it was so regarded by Mr. Nuttall, who cursorily examined those plants in my herbarium.

SARCOSTEMMA ELEGANS, *Decaisne, l. c. p.* 541? Rocky places, Presidio del Norte, July—August; *Parry.* Camp Bache, and on the Cibolo of the Rio Grande; *Bigelow.* Our plant accords with the description of Decaisne, but it may be a distinct species. It differs from the last in the strongly pubescent stem and leaves; the flowers twice as large, and the segments of the corolla oblong and obtuse, with a reticulate venation; whereas in S. cynanchoides the divisions of the corolla are ovate and acute, with several parallel longitudinal veins. The follicles are pubescent, about 4 inches long, half an inch wide in the middle, and tapering to a long point.

SARCOSTEMMA UNDULATUM (n. sp.): volubile, glabratum; foliis lineari-lanceolatis acutis basi subauriculato-cordatis margine undulato-crispatis; pedunculis petiolo 2–3-plo longioribus plurifloris; corona staminea exteriore pelviformi integerrima, interiore foliolis ovatis obtusis gynostegio brevioribus. Mountains east of the Rio Grande, 70 miles below El Paso, June; *Parry.* Copper Mines, New Mexico; *Bigelow.* (No. 1678, *Wright.*) Stem 2–3 feet long, twining, or sometimes prostrate. Leaves 2–4 inches long, and 5–8 lines wide in the middle; tapering to a long point, usually dilated and auriculate-cordate or somewhat hastate at the base; the midrib often whitish on both surfaces; the margin more or less undulate or crisped; petioles about half an inch long. Umbel 8–10-flowered. Peduncles 1–1½ inch long, and the pedicels about the same length. Flowers half an inch in diameter. Segments of the calyx linear-lanceolate. Corolla rotate, purple, smooth internally and externally, the margin ciliolate; segments oblong, obtuse. Gynostegium nearly sessile. Pods 3 inches long, 4 lines in diameter, tapering at each end, slightly pubescent. Resembles S. crispum, *Benth.*, but that is a humbles pecies, (only half a foot long,) the peduncles barely equal the petioles, and the exterior stamineal crown is annular; while in our plant it forms a distinct cup.

SARCOSTEMMA HETEROPHYLLUM (*Engelm. MSS.; Torr. in Pacif. Railroad Rep.* 5, *p.* 363): puberula, volubile; foliis anguste-linearibus brevi-petiolatis acutis basi cordatis v. cordato-hastatis (raro) acutiusculis; pedunculis plurifloris petiolo multo longioribus; corollæ laciniis patulis ovatis acutis ciliatis extrorsum puberulis introrsum glabris (purpurascentibus;) corona stam. exteriore pateriformi integra, inter. foliolis suborbiculatis gynostegium subæquantibus; folliculis longe attenuatis. Ravines and rocky places, borders of the Rio Grande, western Texas, New Mexico, and Chihuahua, westward to Sonora and San Luis Rey, California, April—June. (No. 1681, *Wright.*) Stems numerous, from a somewhat ligneous base, 1–3 feet long, slender. Leaves 1–2 inches long, ½–2½ lines wide, the lower and middle ones more or less cordate, or cordate-sagittate at the base, the lobes entire or denticulate; uppermost leaves sometimes acute at each end; petioles 2–4 lines long. Peduncles 1–2 inches long; umbel 8–12-flowered, the pedicels much shorter than the peduncles. Flower about one-third of an inch in diameter; exterior corona in the form of a shallow cup. Gynostegium nearly sessile. Corolla brownish purple. Near S. lineare, *Benth.**

---

* We have Sarcostemma clausum, *Roem. & Schult.*, from Key West, where it was found by the late Mr. Blodgett.

SARCOSTEMMA HETEROPHYLLUM; var.? umbellis 5–8-floris, pedicellis pedunculo subæqualibus; floribus majoribus; corollæ laciniis oblongis obtusis. Gravelly hills, Rock Creek, and near Camp Bache, also at the mouth of the Great Cañon of the Rio Grande, June—July. (No. 1679, *Wright.*) Perhaps distinct from S. heterophyllum: we have seen no intermediate forms. The leaves are usually longer and wider; the flowers are of a dull purple color, and the segments of the corolla are more strongly ciliate. Gynostegium distinctly stipitate. Follicles 4 inches long, acute at the base, and tapering to a long point.

ASCLEPIAS SULLIVANTII, *Engelm. in Gray's Manual, ed.* 2, *p.* 352. Hill sides, Muerte and Rock Creek; also at the Copper Mines, July—August; *Bigelow.* The pods are sometimes almost entirely free from warts or spines. Leaves often very obtuse, or even emarginate.

ASCLEPIAS JAMESII (n. sp.): glaberrima, subglauca; foliis orbiculato-obovatis subcoriaceis retusis vel emarginatis basi cordatis brevissime petiolatis; umbellis multifloris brevi-pedunculatis; gynostegio constricto; cucullis dilatatis truncatis; processu arcuato falciformi acutissimo exserto; folliculis ovatis lævibus. A. obtusifolia var.? latifolia, *Torr. in Ann. Lyc.* 2, *p.* 117. Plains near the Limpio Mountains, July; *Bigelow.* Tascate, Sonora, July; *Parry.* (No. 1682, *Wright.*) Stem stout, 1–2 feet high. Leaves 3–4 inches long, and 2½–3½ wide, somewhat coriaceous, transversely and reticulately veined, mostly retuse or emarginate, with a small abrupt point; the lower ones almost orbicular; petiole 1–3 lines long. Umbels several, in the axils of the upper leaves. Peduncles 2–4 lines long. Flowers much resembling those of A. Sullivantii. Corolla greenish; segments broadly ovate. Hoods of the crown purplish, very broad, obliquely truncated, the horn with the acute point exserted and projected partly over the stigma, the upper margin undulately 2–3-toothed. Horny margins of the anthers angularly dilated at the base. This species was first discovered by Dr. James, on Long's Expedition to the Rocky Mountains, and was doubtfully regarded as a variety of A. obtusa in my account of the plants collected by that botanist. It was afterwards found by Lieut. Abert, as well as by Fendler, in New Mexico.

ASCLEPIAS EROSA (n. sp.): puberula deinde glabrata; caule erecto simplici; foliis oblongo-ovatis subcoriaceis acuminatis sessilibus margine eroso-denticulatis; umbellis multifloris; pendunculis folio duplo brevioribus; cucullis obovatis obtusis longioribus; gynostegio constricto, processu subulato arcuato longe horizontaliter exserto; folliculis ovatis, acuminatis lævibus.—Valley of the Gila river, near Metate, May—June; *Schott, Thurber.* Stem apparently 2–3 feet high, stout. Lower leaves 5–7 inches long, and 2½ broad, with a long acute point, very rough on the margin, with irregular conspicuous cartilaginous serratures. Umbels 5 to 7, about half as long as the leaves; pedicels 1½ inch long, pubescent. Flowers as large as in A. Cornuti. Corolla greenish white; segments at length reflexed. Hoods of the crown obliquely truncate at the summit, the subulate horn exserted horizontally. Pods (immature) about 2 inches long, and nearly an inch in diameter at the middle.—Apparently allied to A. glaucescens, *H. B. & K.*, but that species has obtuse leaves, much shorter pedicels, and a subsessile gynostegium, which is about the length of the hoods.

ASCLEPIAS ARENARIA (n. sp.): incano-pubescens, deinde glabrescens; caule simplici; foliis oppositis obovatis vel inferioribus ovatis breviter petiolatis, superioribus emarginatis vel retusis; pedunculis brevibus multifloris, cucullis dilatatis obtusissimis utrinque unidentatis gynostegio subsessili longioribus, processu subulato apice subrecurvo; folliculis oblongis attenuatis lævibus.—Sandy banks; Journado del Muerte, and on the upper Rio Grande, in New Mexico, June—July. Plant 12–18 inches high, (apparently sometimes assurgent or prostrate.) Leaves

2½-4 inches long, and 1½-2½ inches wide, when old nearly glabrous and somewhat coriaceous; petioles 2-3 lines long. Peduncles scarcely an inch long. Umbels several, in the axils of the upper leaves, 15-25-flowered. Corolla greenish white; hoods dull pale purple. Follicles 4 inches long, and an inch in diameter in the middle, attenuated to a long point. Allied to A. Jamesii.

Asclepias nummularia (n. sp.): caule humili; foliis oppositis orbiculatis albo-lanatis; pedunculis folio longioribus; cucullis ovatis gynostegio sessili subduplo longioribus, processu falcato vix exserto. (Table XLV, A.) Copper Mines, New Mexico, April; *Bigelow, Thurber.* Santa Maria, Chihuahua; *Parry.* Santa Cruz, Sonora; *Capt. E. K. Smith.*—Stems several from a thick ligneous root-stock, 1-2 inches long. Leaves in 2 or 3 closely approximated pairs, 1-1½ inches in length and breadth, with a very short abrupt acumination, often slightly cordate at the base, clothed with a softly white pubescence. Peduncles 2 or 2½ inches long; umbel 15-20-flowered, the pedicels about three-fourths of an inch long. Corolla greenish white; the segments oblong and reflexed. Hoods obliquely truncate inward, entire, somewhat spreading. Projecting margins of the anthers rounded. Pollen-masses triangular. Immature pods ovate, tomentose.—A remarkable species; very distinct from any other of the genus. It has much the habit of Steinheilia radians, as represented in *Deless. Ic.* 5, *t.* 61.

Asclepias involucrata (*Engelm. MSS.*): caulibus e basi lignoso brevi pluribus; foliis oppositis alternisve lineari-lanceolatis brevi-petiolatis margine tomentosis; umbellis terminalibus sessilibus foliis 2-4 involucratis; cucullis ovatis acutiusculis patentibus gynostegio subduplo longioribus; processu cultriformi vix exserto; folliculis ovato-oblongis lævibus.—Sandy soils, on the Mimbres and near the Copper Mines; also sandy plains between Laguna de Guzman and the Rio Grande; April—May; *Bigelow, Thurber.* San Luis mountain, Sonora; *Capt. E. K. Smith.* (No. 1690, *Wright.* No. 107, *Fendler.*) Stems 3-6 inches long, erect or spreading, somewhat pubescent. Leaves 1½-2½ inches long, opposite and alternate, mucronate, nearly smooth above, except on the margin, a little pubescent on the veins underneath. Umbel 10-15-flowered, involucrate, with 1-2 pairs of leaves similar to those of the stem. Pedicels about three-fourths of an inch long. Corolla greenish white, the segments ovate and reflexed. Hoods spreading, and their points often a little recurved. Margin of the anthers projecting and acutely angular at the base. Pollen-masses pyriform. Pod 2½ inches long, and ¾ inch in diameter, acute, but scarcely attenuated at the summit.

Asclepias brachystephana (*Engelm. MSS.*): caule ramoso; foliis oppositis lineari-lanceolatis longe angustatis basi in petiolum brevem attenuatis glabratis; umbellis pluribus extra-axillaribus pedunculatis plurifloris; cucullis truncatis antice bidentatis gynostegio sessili dimidio brevioribus, processu falciformi verticali; folliculis oblongis lævibus.—Sandy soils, Valley of the upper Rio Grande, Chihuahua, and Sonora; April—July. (No. 1692, *Wright.*) Dr Gregg found it in dry valleys west of Saltillo. Stem 8-12 inches long, branching from the base upward. Leaves 3-6 inches long, gradually tapering from a rather broad base to a long narrow point; petiole 2-3 lines long. Umbels 3-8 on each branch, the peduncles much shorter than the pedicels. Corolla dull purple, the segments ovate-oblong, reflexed. Cuculli broader than long, the inner margin produced into a tooth above. Margins of the anthers angular at the base. Pollen-masses pyriform. Pods 2 inches long, acuminate.

Asclepias incarnata, *Linn. Sp. p.* 314; *Decaisne, l. c. p.* 567. Copper Mines, New Mexico, July; *Bigelow.* Var. foliis lato-linearibus vix puberulis. Banks of Devil's river, western Texas, September; *Bigelow.* Lower Rio Grande; *Schott, Wright.*

Asclepias tuberosa, *Linn. Sp. p.* 316; *Decaisne, l. c.* Western Texas, New Mexico and Sonora, June—July.

Asclepias parviflora, *Willd. Sp.* 1, *p.* 1267? Ravines head of Rock Creek, western Texas, July; *Bigelow.* (No. 1684, *Wright.*) Many years ago, Prof. L. K. Gibbes, in his Catalogue of the Plants of Columbia, South Carolina, (*p.* 11,) showed that the seeds of this species (at least in his specimens) "want the usual comose appendage of the genus!" I have verified his observation in specimens from various parts of the southern States. In Dr. Bigelow's plant the seeds are crowned with a tuft of hairs, and yet I cannot find that it differs in any other respects from the common A. parviflora, except that the flowers are about one-third larger.

Asclepias verticillata, *Linn. Sp. p.* 315; *Decaisne, l. c.* A. linearis, *Scheele in Linnæa*, 21, *p.* 758. Plains between Van Horne's Wells and Muerte, July; *Bigelow.* Guadalupe river, Texas; *Schott.*

Var. galioides, *Decaisne, l. c.* A. galioides, *H B. K.* Near San Elceario, May; *Parry.* New Mexico and Sonora; common. (No. 1685, 1686 and 1689, *Wright.*) Our plant seems to be the same as Hartweg's No. 216.

Asclepias fascicularis, *Decaisne, l. c. p.* 569. A. macrophylla, *Nutt. Pl. Gamb. in Journ. Acad. Sc. Philad.* (*n. ser.*) 1, *p.* 180. Grassy places near San Luis Rey, California, October, (in fruit); *Parry.* Variable in the breadth of the leaves.

Asclepias Linaria, *Cav. Ic.* 1, *p.* 42, *t.* 57, *ex Decaisne, l. c. p.* 570. Sierra de Pajarito, Yanos, Sonora, May; *Schott.* Between Saltillo and San Luis Potosi; *Berlandier* (No. 1350) & *Gregg* (No. 562.)

Asclepias macrotis (n. sp.): nana, suffruticosa; caule ramosissimo; ramulis rigidis unifariam puberulis; foliis oppositis anguste linearibus glabris mucronatis; pedunculis brevibus extra-axillaribus paucifloris; cucullis longissime lineari-attenuatis patulis margine pubescentibus; processu obtuso vix exserto; gynostegio sessili brevissimo. (Tab. XLV, B.) Rocky hills near El Paso, and on the mountains below San Elceario, May—June; *Bigelow, Parry.* (No. 1691, *Wright.*) Stem about a span high intricately branched from the thick crooked base, which is somewhat ligneous, the branches terete. Leaves 1–1½ inch long and half a line wide, revolute on the margin. Umbels 4–5-flowered. Peduncles 2–3 lines long; pedicels 4–5 lines. Segments of the calyx lanceolate. Corolla pale purple; the segments ovate and reflexed. Hoods with an ovate base, their elongated tapering extremities diverging horizontally; the horn slightly curved, short and obtuse, pubescent near the summit. Gynostegium very short, closely sessile, anthers broader than long, with narrow cartilaginous margins. Pollen-masses elongated pyriform. Pods oblong, lanceolate, acuminate, even. This very remarkable species has been found only in the places mentioned above. It has much the appearance of Gomphocarpus revolutus of South Africa.

Asclepias (Otaria) longicornu, *Benth. Pl. Hartw. p.* 24; *Decaisne, l. c. p.* 570. A. Lindheimeri, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 42, (*No.* 272.) Plains and rocky places, New Mexico and western Texas, along the middle and lower Rio Grande, June—September. Borders of Aqua Fria river, Mexico; *Gregg.* (No. 1683, *Wright.*)

Asclepias subulata, *Decaisne, l. c. p.* 571; *Torr. in Pacific R. Road Expl.* 6, *p.* 362, *t.* 7. Lower California, near the Mexican boundary line; *Parry.* Ravines and hills sides of the desert, near Fort Yuma, June; *Schott.*

Seutera maritima, *Decaisne in DC. Prodr.* 8, *p.* 590. Cynanchum angustifolium, *Pers. Syn.* 1, *p.* 274; *Nutt. Gen.* 1, *p.* 164. Saline marshes near the sea coast, western Texas; *Wright.*

GONOLOBUS GRANULATUS (*Scheele in Linnæa* 21, *p.* 759.): volubilis pilis patentibus vel reversis hirsutus; foliis longius petiolatis ovatis acuminatis profunde cordatis; pedunculo petiolum superante; umbellis paucifloris; corollæ laciniis ovatis obtusis reticulato-venosis extus pilosiusculis, intus glabris; corona stam. annuliformi; gynostegio substipitato applanato; antherarum cuspidibus tenuissimis inflexis; stigmate nudo; folliculis lanceolatis sparsim echinatis glabris. Mountain ravines, near Live Oak Creek, September; *Bigelow*. Sonora; *Schott*. Monterey, Neuvo Leon; *Dr. Edwards and Major Eaton*. (No. 543 and 1674, *Wright*. *No.* 350 *Lindheimer's Texan Coll.* 1846.) Stem herbaceous, twining over shrubs and small trees. Leaves varying from 2–3½ inches long, and 1½–2½ inches wide, slightly pubescent on both sides; the petiole 8–10 lines long. Peduncles usually about one-fourth longer than the petioles. Umbel (or rather very short raceme) 4–8-flowered; the longer pedicels about an inch in length. Flowers 5 or 6 lines in diameter. Calyx hairy; the segments lanceolate. Corolla rotate, greenish or purplish, with darker reticulated veins. Stamineal crown reduced to a narrow ring. Anthers with the membranous appendage very thin and inflexed under, not lying on the stigma. Pollen-masses obliquely obovate. Stigma obtusely 5-angled, flat. Follicles 4½ or 5 inches long and about ¾ inch in diameter, armed with distant, subulate, rather firm prickles.

LACHNOSTOMA? PARVIFLORA (n. sp.): humifusum, pilosum; foliis ovatis vel orbiculato-ovatis acutis brevi-petiolatis; pedunculis folio multo-longioribus; floribus primo umbellatis deinde racemosis; corolla rotata, laciniis ovatis; coronæ stam. phyllis 10 biseriatis, 5 exterioribus alte bifidis laciniis acuminatis, 5 interioribus subulatis utrisque gynostegio longioribus; folliculis ovato-oblongis spinis innocuis villosis dense onustis. San Pedro Creek, western Texas; *Wright*, (No. 1673.) Table-land between Ringgold Barracks and Laredo, on the lower Rio Grande, June—July; *Schott*. Root tuberous. Stem clothed with a gray spreading pubescence, branching from the base; the branches 8–12 inches long. Leaves varying narrowly to broadly ovate, about three-fourths of an inch long, usually waved and often crisped on the margin. Peduncles axillary and subterminal, at first only a little longer than the leaves, but in fruit twice or thrice longer. Umbels or racemes 5–10-flowered. Corolla about 2½ lines in diameter, purplish. Stamineal crown consisting of 10 distinct leaflets in a double series; the 5 exterior cleft about halfway down, the points curved over the stigma; the 5 interior subulate, arising from the base of the exterior leaflets, which they considerably exceed in length, and are likewise curved over the stigma. Gynostegium sessile. Pollen-masses nearly orbicular. Pods 2–3 inches long, densely covered with short thick rather fleshy processes. This plant can scarcely be referred to any of Decaisne's genera, but I am unwilling to propose a new genus for its reception while my knowledge of the Mexican Asclepiadaceæ is so imperfect.

GONOLOBUS BIFLORUS, *Nutt.* Chthamalia biflora, *Decaisne in DC. Prodr.* 8, *p.* 605. Dry prairies, western Texas; *Wright*, (No. 543.) New Braunfels, *Lindheimer*, (No. 162.) Stems prostrate, 1–2 feet long, not twining. Flowers dark purple. Lobes of the stamineal crown with an internal ridge which is produced into an inflexed curved process. Follicles 3–4 inches long, echinate with soft prickles. C. pubiflora, *Decaisne*, *l. c.*, is Gonolobus prostratus of Elliott, but not of R. Brown.

GONOLOBUS (CHTHAMALIA) CYNANCHOIDES, *Engelm. & Gray*, *Pl. Lindh. pars I*, *p.* 43. Western Texas, *Wright*. Nearly related to the last, but differs in the smaller flowers, and in the short excavated process of the lobes of the corona. (No. 545, *Wright*. No. 1951, *Berlandier*.)

GONOLOBUS (CHTHAMALIA) PRODUCTUS (n. sp.): caule volubili pubescente; foliis ovatis longe acuminatis cordatis, auriculis approximatis rotundatis puberulis; pedunculis petiolis subæqualibus 3–5-floris; corolla campanulata, tubo brevi, laciniis lanceolatis erectis; corona stam. cupuliformi crenato gynostegio breviore; folliculis (immaturis) lævibus. Climbing over bushes. Banks of Rock Creek; *Bigelow.* Valley of the Limpio, and along the Rio Grande, June; *Parry*, (No. 1675, *Wright.*) It was also found by Dr. Gregg, in Cadena, Mexico. Plant 2–4 feet long, twining around low bushes or trailing on the ground. Lower leaves about 2 inches long; the deep sinus at the base often almost closed by the approximation of the auricles. Sepals ovate–lanceolate, with a minute gland on the inside of each sinus. Corolla about 4 lines long, mostly of a dull purple color, but sometimes greenish. Stamineal crown a shallow cup, about two-thirds the length of the gynostegium, with the margin crenate or slightly lobed. On the inside are 5 adnate processes which are connected with the gynostegium and outwards terminate in a short tooth which is not exserted. Stigma obtusely 5 angled. Pollen-masses short and roundish. There are no ripe pods in the collections.

Gonolobus(?) parvifolius (n. sp.): pubescens; caule prostrato ramosissimo vix volubili; foliis (semiuncialibus) deltoideo-ovatis basi cordatis crassiusculis; floribus axillaribus solitariis vel geminis sessilibus; corolla urceolato-rotata ad mediam usque 5-lobata; corona stam. 5–loba, lobis ovatis obtusis gynostegio brevioribus; folliculis lineari-lanceolatis longe attenuatis lævibus. Sides of hills, cañon of the Rio Grande, below Mt. Carmel, October; *Parry.* Mountain near the Limpia, western Texas; *Wright.* Stem 12–18 inches long, the upper branches somewhat twining. Leaves 4–6 lines long, deltoid or sometimes hastate-cordate, rather acute, mucronate; petioles half as long as the lamina. Flowers on short axillary pedicels. Corolla about 2½ lines in diameter, dull yellow, (brown when dry;) the lobes triangular-ovate. Stamineal crown 5-lobed, the lobes obtuse or slightly emarginate, concave, with a prominent ridge on the inside. Stigma obtusely 5-angled, flat. Pods 3½ inches long, tapering to a long slender point.

OLEACEÆ.

Fraxinus Scheideana, *Schlecht. & Cham. in Linnæa*, 6, *p.* 391; *DC. Prodr.* 8, *p.* 278. Var. parvifolia: foliolis 1–3-jugis vix uncialibus. Rocky places in limestone districts on the Rio Grande, from the San Pedro to the Pecos; *Schott.* Mountains of Santa Rosa, Cohahuila; *Bigelow, Parry.* A graceful shrub 5 or 6 feet high.

Fraxinus viridis, *Michx. f. Sylv.* 2, *p.* 197, *t.* 120. Var. Berlandieriana. F. Berlandieriana, *DC. l. c.* Near Eagle Pass on the Rio Grande; *Bigelow.* (No. 602 and 2112, *Berlandier.* No. 653 (Coll. 1846) and No. 41, (Coll. 1847,) *Lindheimer.*) Leaflets 5–7, or often 3, mostly cuneate at the base, shining on the upper surface; the teeth larger and more salient than in the F. viridis of the Middle States; the fruit also is more acute.

Fraxinus pistaciæfolia, *Torr. in Bot. Whippl. Rep. p.* 128. F. velutina, *Torr. in Emory, Rep. p.* 149. On the Rio Grande and its tributaries. Near the Copper Mines, New Mexico; *Bigelow.* (No. 1697, *Wright.*) Ojito, Mexico; *Gregg.* Sonora; *Schott.* A downy variety, with narrowly lanceolate attenuate leaves, was found by Mr. Thurber at Guadalupe Cañon, Chihuahua. This species often grows from 15–20 feet high. Sometimes it attains the height of 30 feet. The fruit is often 3-winged.

Fraxinus cuspidata (n. sp.): foliolis 2–3-jugis lanceolatis vel oblongo-lanceolatis acutis cuspidatis serratis vel integerrimis utrinque glabris longe petiolulatis; samaris oblongis utrinque obtusis. Eagle Mountains and Great Cañon of the Rio Grande; *Parry, Bigelow.* (No. 1698, *Wright*,) (mixed in my set with F. pistaciæfolia.) A well characterized species, easily known by the small fruit (scarcely 8 lines long,) which is broad in proportion and not contracted at the base. The leaflets are narrower and entire in Mr. Wright's specimen, while in Dr. Parry's they are broader and mostly serrate.

FRAXINUS DIPETALA, *Hook. & Arn. Bot. Beech* p. 362, *t.* 87. Var.? TRIFOLIOLATA: foliolis unijugis ovatis vel obovatis integerrimis aut versus apicem crenato-serratis basi in petiolulum attenuatis; samaris lineari-oblongis emarginatis. Sterile mountains a few miles south of the Mexican boundary line, in Lower California, July (in fruit); *Parry*. A shrub or small tree growing in clumps, sometimes 20 feet high, with a trunk three inches in diameter. Leaflets never more than a single pair and a terminal one; sometimes, indeed, reduced to the single terminal one; the largest scarcely more than an inch long; common petiole channelled above. Flowers not known. Fruit in a loose cymose panicle, about three-fourths of an inch long, and 2¼ lines wide, (in one specimen 3 lines wide,) only a little contracted at the base. As the flowers of this ash are unknown, and the fruit of F. dipetala has not yet been seen, it remains uncertain whether they are distinct, or are only extreme forms of one species.

FORESTIERA PHILLYREOIDES. Piptolepis phillyreoides, *Benth. Pl. Hartw. p.* 29. Var. SPATHULAEFOLIA: foliis spathulatis subcoriaceis. Near Monterey, Neuvo Leon and plains west of San Pablo; *Gregg*. A shrub about 5 feet high. Not yet found in fruit. There can be no doubt of the identity of Piptolepis and Forestiera. The flowers of both agree in all essential characters. We place this genus in Oleaceæ where we have for many years regarded it as belonging, adopting the view of Richard, who more than half a century ago, said of it "genus affine Chionantho."* Other authors have pointed out its affinity to Oleaceae; but more recently Tulasne.† has clearly shown that this is its true place.

FORESTIERA LIGUSTRINA, *Poir. Enc. Suppl.* 2, *p.* 664. F. pubescens, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 177. Adelia ligustrina, *Michx. Fl.* 2, *p.* 224. Borya ligustrina, *Willd. Sp.* 4, 711; *Pursh, Fl.* 2, *p.* 22. Borders of the Rio Grande in western Texas, and in Chihuahua. Leaves about an inch long, obovate or obovate-oblong, mostly obtuse, abruptly narrowed at the base with a short petiole, slightly serrate, when young pubescent, but at length nearly glabrous except along the midrib and on the petioles. Fruit oblong, about 4 times longer than the pedicels, dark blue, the pulp rather thick and sweetish. Nut nearly even. This is not an uncommon plant in Florida, and on the upper waters of the Red and Arkansas rivers. Michaux has incorrectly described the leaves as *very entire*.

FORESTIERA RETICULATA (n. sp.): foliis ovatis ramulisque glabris acutis vel acuminatis subcoriaceis prominente reticulato-venosis denticulato-serratis subtus porulosis; cymulis simplicibus; fructibus ovalibus, obtusis apiculatis pedicellis ⅓ longioribus. Crevices of rocks and in ravines near the Pecos, on the Rio Grande; *Schott*. Ravines near White Oak Creek; *Bigelow*. Western Texas; *Wright*, No. 565. Branches glabrous, but dotted with minute whitish warts. Leaves 1–1½ inch long, acute at the base, the veins strongly reticulated, especially (in the dry specimens) on the upper surface; the midrib very slightly pubescent underneath. Staminate flowers in small simple cymules with short pedicels. Fertile cymules 3–5 flowered. Fruit about 3 lines long, very dark purple, with a thin sweet pulp, sometimes 2-celled and 2-seeded. Nut oblong, the shell thin and fragile, marked with prominent longitudinal veins. Seed conformed to the cavity of the shell; testa thin pale brown, slightly sulcate longitudinally. F. porulosa,

---

* Forestiera differs from Chionanthus chiefly as from Fraxinus ornus.

† Annales des Sc. Nat., ser. 3, 15, p. 254.

Poir., (Adelia porulosa, *Michx.*) which much resembles this species, differs in its entire obtuse leaves, narrowly revolute on the margin.

FORESTIERA SPHÆROCARPA (n. sp.): foliis ad apicem ramulorum aggregatis, rhomboideo-oblongis parvulis acutiusculis superne crenato-serratis utrinque pubescentibus; cymulis fœmineis trifloris; pedicellis pubescentibus fructu subgloboso vix dimidio brevioribus. Dry ravines near the Limpio, July (in fruit); *Bigelow.* Leaves about three-fourths of an inch long, somewhat coriaceous, usually 4 or 5 together in a cluster at the extremity of the short branchlets. Fruit the size of a pepper-corn, with a thin pulp, dark purple and covered with a bloom. This species is easily distinguished by the small fasciculate leaves and small subglobose fruit.

FORESTIERA ANGUSTIFOLIA (n. sp.): foliis fasciculatis lineari-spathulatis vel anguste-lanceolatis integerrimis obtusis glabris obsolete venosis subtus porulosis; fructibus ovatis acutis. Western Texas near the Rio Grande; *Wright,* No. 566. Near New Braunfels and shore of Matagorda Bay, February; *Lindheimer.* Matamoras, Tamaulipas; *Berlandier,* No. 3024. Mexico; *Gregg.* A large shrub, densely branched. Leaves in fascicles of 3 to 5, on very short spurs, or undeveloped branches. They are 8–10 lines long and 2–2½ lines wide, somewhat coriaceous. Cymules 3–5-flowered arising from the centre of the tuft of leaves. Bracteoles broadly obovate. Flowers hermaphrodite, 3–4-androus. In Berlandier's specimens the leaves are narrowly lanceolate, more coriaceous, and revolute when dry.

JASMINACEÆ.

MENODORA SCABRA, *Gray, in Sill. Journ. n. ser.* 14, *p.* 44; *Torr. in Bot. Pacif. R. Road Rep.* 7, *p.* 18, *t.* 7. Western Texas and New Mexico; *Parry, Bigelow.* Arroyo del Pozo Verde, Sonora, July; *Schott.* Ojo de Vaca, etc., Chihuahua; *Thurber.* (No. 563 and 1694, *Wright.*)

MENODORA LONGIFLORA, *Gray, l. c.* Ravines and rocky hills along the Rio Grande and its tributaries. (No. 1695 and 1696, *Wright.*)

MENODORA HETEROPHYLLA, *Moricand in DC. Prodr.* 8, *p.* 316; *Gray, l. c.* Sandy plains and borders of streams, western Texas and Neuvo Leon; May—October.

ARISTOLOCHIACEAE.

ARISTOLOCHIA CALIFORNICA, *Torr. Bot. Whipp. Rep. p.* 128. Napa county, California, March; *Thurber.*

ARISTOLOCHIA LONGIFLORA, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 51. Sandy alluvions of the Rio Grande, below the mouth of Los Moras, August; *Schott.*

ARISTOLOCHIA BREVIPES, *Benth. Pl. Hartw. p.* 15. A. Wrightii, *Seemann, Bot. Herald, p.* 330, *t.* 72. Dry rocky ravines northwestern Texas, Chihuahua, and Sonora. (No. 567, 568, and 1700, *Wright.*) No. 1701 of Wright is a form with the lobes of the leaves narrower and less rounded at the extremity. Mr. Seemann's plant was collected in Durango.

NYCTAGINACEÆ.

SELINOCARPUS DIFFUSUS, *Gray, l. c;* var. PARVIFOLIUS: foliis parvis (vix semi-pollicaribus); floribus solitariis. Cañons of the Rio Grande, October; *Parry.* Presidio del Norte, August; *Bigelow.*

OXYBAPHUS GLABRIFOLIUS, *Vahl. Enum.* 2, *p.* 40? Western Texas, near the Rio Grande, below El Paso. This seems to have been collected only by Mr. Wright in his earlier explorations. It is his No. 605. Although the involucres are mostly 2 or 3-flowered, it may be only a variety of O. glabrifolius.

OXYBPAHUS AGGREGATUS, *Vahl l. c.* Plains near the Limpio, Texas; *Bigelow.* (No. 1717, *Wright.*)

NYCTAGINACEÆ.

MIRABILIS LONGIFLORA, *Linn.; Choisy in DC. Prodr.* 13, *pars* 2, *p.* 428. Copper Mines, New Mexico, July; *Bigelow, Thurber.* Mountains east of El Paso, *Wright,* No. 575. his No. 1702 is a glabrous or glabrate form of the species.

MIRABILIS MULTIFLORA, *Gray.* Oxybaphus multiflorus, *Torr. in Ann. Lyc. N. York,* 2, *p.* 237. Quamoclidion multiflorum, *Torr.; Gray, N. Gen. & Sp. Nyct. in Sill. Jour. ser.* 2, 14, *p.* 321. Nyctaginia Torreyana, *Chois. l. c.* Valley of the Rio Grande and at the Copper Mines, April—August. San Felipe, California; *Parry.* (No. 1703, *Wright;* 740, *Fendler;* 1327, *Coulter,* Mex. Coll.)

MIRABILIS OXYBAPHOIDES, *Gray.* Quamoclidion oxybaphoides, *Gray, l. c.* Western Mexico; *Bigelow, Wright.*

MIRABILIS CALIFORNICA, *Gray.* Oxybaphus lævis, *Benth.?* O. glabrifolius, *Torr. Bot. Whipp. Rep. p.* 131, non *Vahl.* (TAB. XLVI.) Dry hills, San Diego, California; *Parry, Thurber.* Somewhat prostrate, forming dense tufts commonly more or less pubescent, and rarely glabrate.

OXYBAPHUS NYCTAGINEUS, *Sweet; Choisy, l. c.* Western Texas and New Mexico; also in the adjoining Mexican States of Chihuahua and Cohahuila, near the Rio Grande. An extremely variable species, as is shown by Dr. Gray in his note below.

OXYBAPHUS HIRSUTUS (*Sweet; Choisy, l. c.*): caule pilis patentibus hispido; foliis lanceolatis pilosis utriusque angustatis brevipetiolatis margine undulatis ciliatisque; involucris subsolitaris axillaribus; pedunculis (3–4 linearibus) demum reflexis; involucris subtrifloris; fructu hirsuto inter costas corrugato.—Gravelly hills on the Limpio, &c., July; *Bigelow, Wright.* Stem 12–15 inches high, apparently sometimes assurgent, branching from the base, hispid with short-spreading or reflexed hairs. Leaves 2–2½ inches long, and 4–5 lines wide in the middle; the uppermost ones more undulate than the lower. Peduncles slender, in the axils of the upper leaves; the uppermost ones appearing clustered from the branches being undeveloped. Involucre hairy, at length broadly campanulate and reticulate. Flowers all fallen in our specimens. Fruit 2½ lines long, obovate.

OXYBAPHUS ANGUSTIFOLIUS, *Sweet; Choisy, l. c. p.* 433. Plains and river alluvions, western Texas, New Mexico and Chihuahua; June—September.

OXYBAPHUS COCCINEUS (n. sp.): glaberrimus; caule gracili ramosissimo erecto; foliis linearibus elongatis integerrimis; panicula terminali laxa; involucris 3-floris campanulatis 5-fidis, segmentis acutis; perigonio infundibuliformi (coccineo) involucro 4–5-ties longiore; fructu clavato-oblongo profunde sulcato. Hill sides, Copper Mines, and on the Mimbres; *Wright,* (No. 1723) *Thurber, Bigelow.* Highlands between the Nueces and San Pedro; April—June; *Schott.* Santa Cruz Mountains, Sonora; *Capt. E. K. Smith.* Root ligneous, black and tortuous. Stems 12–18 inches high, slender terete, paniculately branched above. Leaves 2–3 inches long, and mostly about a line wide, but sometimes 2 lines. Inflorescence a loose cymose panicle. Involucres sometimes solitary in upper axils and the pedicels recurved. Perianth about three-fourths of an inch long, funnel-form, with a long narrow tube; the limb of a bright crimson, 5-lobed, with the lobes notched. Stamens and style exserted. Fruit pubescent, strongly 5-ribbed and slightly rugose. This species is almost intermediate between Oxybaphus and Quamoclidion.

ALLIONIA INCARNATA, *Linn.; Choisy, l. c.* Sandy river-banks and on gravelly hill-sides. Common in New Mexico, western Texas, and Chihuahua, westward to Sonora and California; flowering from April to September. (No. 1716, *Wright.*) The 3 leaves of the involucre are ovate, concave, and are scarcely at all united at the base. Perianth campanulate-funnel-form, mostly 4-lobed, the lobes notched. Stamens usually 3, not exserted. Fruit oval, the margin winged, usually 4–6-toothed on each side, and reflexed over the back, so that the opposite sides nearly meet, and thus partially conceal two longitudinal dorsal rows of spherical stipitate glands. Achenium oblong, apiculate with the persistent base of the style.

ABRONIA CYCLOPTERA, *Gray, l. c. p.* 319. A. (Tripterocalyx) micrantha, *Torr. in Frém.* 1*st Rep. p.* 96. Sandy places on the Rio Grande, from Doña Ana to San Elceario, April, June; *Wright*, No. 1712.

ABRONIA ARENARIA, *Menz. in Hook. Exot. Bot. t.* 193; *Choisy, l. c.* Sea beach, Monterey, California; *Parry.* Flowers bright rose-color. Perennial fusiform root sometimes 4 feet long and 2 inches in diameter. It is said to be eaten by the Indians. Common along the coast of California, and extending to Puget's Sound.

ABRONIA UMBELLATA, *Lam. Ill. t.* 5; *Hook. l. c. t.* 194; *Choisy, l. c.* Abundant on the coast of California. Root smaller and more branching than in the preceding species; *Parry.*

ABRONIA MELLIFERA, *Dougl. in Hook. Bot. Mag. t.* 2879; *Choisy, l. c.* Sandy hills near El Paso, etc., westward to the Colorado, California, April—June The wings are triangular and terminate abruptly at the summit, where they are dilated laterally, so that the fruit appears truncated or turbinate. The body of the fruit is much shorter than in the next species.

ABRONIA FRAGRANS, *Nutt. MSS.; Hook. Kew Jour Bot.* 5, *p.* 261; *Torr. & Gray, Bot. Beckwith Rep. p.* 14, *t.* 10. Sandy hills on the upper Rio Grande, and west to Chihuahua, April to August. The mature fruit is distinctly but narrowly 5-winged. What was cited as a dwarf form of A. mellifera in *Bot. Whippl. Rep. p.* 131, is A. fragrans.

NYCTAGINIA CAPITATA, *Choisy, l. c.* Western Texas and valley of the Rio Grande, common. (No. 1709, *Wright;* 680, *Lindheimer, &c.*)

ACLEISANTHES LONGIFLORA, *Gray, l. c.* (TAB XLVI.) Sandy soils, western Texas and valley of the Rio Grande, on both sides of the river, June—October. (No. 599 and 1704, *Wright.*) The stamens and style are frequently much exserted in the later flowers, as they are in those of A. Berlandieri.

ACLEISANTHES ANISOPHYLLA, *Gray, l. c.* In alluvial soil, Turkey creek, and on Rio San Pedro, western Texas. (No. 598 and 1706, *Wright.*)

ACLEISANTHES BERLANDIERI, *Gray, l. c.* Nyctaginia obtusa, *Choisy, l. c. p.* 429. Near Laredo, lower Rio Grande, June; *Schott.* (No. 1705, *Wright;* No. 1544, 2007, 3044, and 3203, *Berlandier.*) Leaves mostly acute. Flowers white, striped with pale purple.

ACLEISANTHES CRASSIFOLIA, *Gray, l. c.* On the Rio Grande, from Los Moros up to the Pecos, October; *Schott.* (No. 599*a*, *Wright*)

PENTACROPHYS WRIGHTII, *Gray, l. c. p.* 318. (TAB. XLVII, B.) Rocky hills near Leon Springs, Mexico, September; *Bigelow.* Between Victoria and San Antonio, Texas; *Schott.* In all our specimens the flowers are expanded, with a slender tube an inch and a half long and exserted stamens. The fruit of these flowers differs from that of the unexpanded precociously fructified ones from which Dr. Gray drew the generic character. The 5 glands, instead of being prominent and crowning the fruit, are small, rather depressed, and seated on a neck or constricted portion of the fruit a little below the summit.

SELINOCARPUS CHENOPODIOIDES, *Gray, l. c.* Gravelly hills and valleys on the Rio Grande, from El Paso to the Presidio del Norte, and westward to Ojo de Vaca, Chihuahua, April—July. (No. 1707, *Wright.*)

SELINOCARPUS ANGUSTIFOLIUS (n. sp.): subviscoso-puberulus; caule fruticuloso e basi ramosissimo; foliis angusto-ellipticis acutiusculis; floribus in axillis superioribus solitariis demum pendulis; perigonio infundibuliformi tubo breviusculo; staminibus 5 vix exsertis. (TAB. XLVII, A.) Gravelly table land near Presidio del Norte, August; *Parry, Bigelow.* Stem apparently diffuse, the upright branches 6–10 inches high, slender. Leaves 6–8 lines long, 1–2 lines wide; the petiole scarcely a line long. Flowers on short pedicels in the uppermost axils, some of them fructifying without being fully expanded, but mostly with a dilated funnel-form border and a tube 1–2 lines long. Stamens and style a little exserted. Fruit as in the preceding species.

BOERHAAVIA PURPURASCENS, *Gray, l. c., p.* 321. Hills near the Santa Rita, Copper Mines, New Mexico; *Wright.* Ravines and rocky hills, Presidio del Norte, July—August; *Parry, Bigelow.* The inflorescence at length becomes elongated, the flowers separating from each other and forming interrupted or somewhat verticillate spikes. The species is closely allied to B. spicata, *Choisy.*

BOERHAAVIA WRIGHTII, *Gray, l. c.* Santa Barbara, southern New Mexico, August; *Bigelow.* Near El Paso; *Wright.* Copper Mines, New Mexico; *Thurber.*

BOERHAAVIA LINEARIFOLIA, *Gray, l. c.* Arid soils; valley of the Rio Grande, and near the Copper Mines, New Mexico, June—August. The lower leaves are sometimes ovate-lanceolate.

BOERHAAVIA ERECTA, *Linn.; Choisy, l. c. p.* 450. Western Texas, New Mexico, and Chihuahua, June—August. We follow Dr. Gray in referring to this species, various forms of an annual Boerhaavia, of which there are numerous specimens in the collection. B. erecta, however, is said by Choisy to be perennial.

BOERHAAVIA PANICULATA, *Rich.; Choisy, l. c.* Western Texas, near the Rio Grande, June—August.

BOERHAAVIA ANISOPHYLLA (n. sp.): caulibus glabriusculis diffusis basi lignosis; paniculis laxe ramosissimis inferne nudis, ramulis filiformibus; foliis ovatis cordatis brevi-petiolatis glabris undulatis in eodem pari inequalibus supra pallidis subtus albidis; floribus laxe subcymosis breviter pedicellatis basi 3-bracteolatis, bracteolis persistentibus lanceolatis acutissimis; perianthiis rotatis; staminibus 5–8; fructibus obovato-oblongis glabris 5-costatis (non truncatis), costis angustis. Entrance of the Great Cañon of the Rio Grande, October; *Parry, Bigelow.* Plant 1–2 feet high. Lower part of the stem slightly pubescent. Leaves in pairs, unequal in size, the larger an inch long and half an inch or more broad. Perianth nearly half an inch in diameter with scarcely any free tube, purple. Stamens and style much exserted. Fruit a line and a half long. Near B. linearifolia, but that is glandularly viscid or villous, the leaves are usually much narrower and hispid on the margin, and the costæ of the fruit are thick and rounded. Dr. Parry collected at the Presidio incomplete specimens of another Boerhaavia, which may be undescribed. It differs from B. anisophylla in the much larger and more diffused panicle, smaller flowers, which are mostly solitary at the extremity of the branchlets, the hispid tube of the perianth, and the hairy fruit.

BOERHAAVIA SPICATA, (*Choisy, l. c. p.* 456?): caulibus e radice annua erectis minute pubescentibus; foliis ovatis sæpius obtusis integris repando-dentatis v. undulatis, inferioribus subcordatis; paniculæ ramulis in racemis sparsifloris desinentibus; bracteis bracteolisque lanceolatis cuspidatis; floribus (minutis) triandris; fructibus cylindraceo-clavatis glabris obtuse 5-costatis apice rotundatis. Ravines and damp sandy places. Presidio del Norte; *Parry, Bigelow.* Chihuahua; *Thurber.* Valley of the Gila; *Schott;* May—September. Plant 12–18 inches high, slender, the stem somewhat viscous. Leaves an inch long, on conspicuous petioles, often dotted. Racemes when in flower scarcely half an inch long, but in fruit 1–2 inches. Flowers scarcely a line in diameter, on very short pedicels. Fruit 1½ line long. This seems to be the same as No. 1425 (which is without leaves) of Coulter's Mexican Collection; but B. spicata, as described by Choisy, differs in the lanceolate acute leaves and in some other unimportant characters.

BOERHAAVIA SCANDENS, *Linn.; Choisy, l. c.* B. Grahami, *Gray, l. c.* Dry ravines near the Cibola of the Rio Grande, August; *Bigelow.* El Podrero, Sonora, June; *Schott.* (No. 3204 and 3205, *Berlandier.*) We can discover no essential difference between B. Grahami and our West Indian specimens of B. scandens. Indeed, Dr. Gray suspected they were not distinct. The free portion of the calyx-tube is as short in the latter as in the former, and neither plant is climbing, being only prostrate, or not unfrequently even erect; so that the specific name is inappropriate.

BOERHAAVIA ERIOSOLENA, *Gray, l. c. p.* 322. Gravelly plains near Presidio del Norte, and below the Great Cañon of the Rio Grande, September; *Parry, Bigelow.* Annual. Plant 1–2 feet high. Leaves orbicular-cordate, 1½–2½ inches in diameter. Flowers often precociously fructified, and then the somewhat persistent tube becomes more or less elongated, sometimes 5–8 lines or more; but the limb, in such cases, does not expand.

BOERHAAVIA LEIOSOLENA (n. sp.): perennis; caule glabro erecto superne nudo; foliis rotundato-cordatis carnosis utrinque elevato-punctatis margine crenato-denticulatis glandulosisque; paniculæ ramis distantibus paucifloris, pedicellis subfasciculatis brevissimis; bracteis bracteolisque minutis; perianthii tubo elongato glabro; fructu turbinato 10-striato; staminibus 5. In gypseous soil, Great Cañon of the Rio Grande, 70 miles below El Paso, June; *Parry.* Stem 2–3 feet high, arising from a somewhat ligneous root. Leaves 2–3 pairs, near the base of the stem, 2–3 inches in diameter, roughened on both sides, (at least in dry specimens,) with little elevated dots or papillæ, and the upper surface somewhat flocculose-pubescent. Panicle naked or with only a pair of small leaves at the base of the lowest branches. Flowers somewhat fasciculate toward the summit of the branchlets. Perianth with the free portion of the tube nearly an inch long, the limb ovate but scarcely expanded in any of our specimens; the adherent portion of the tube expanded at the summit into an annulate narrow wing. Fruit about 2½ lines long, turbinate, crowned with a conical summit. This is evidently allied to the last species, and is a very remarkable plant.

BOERHAAVIA GIBBOSA, *Pavon.; Gray, l. c. p.* 323. Tinantia gypsophiloides, *Mart. & Gal.; Choisy, l. c. p.* 457. Borders of the Rio Grande, from El Paso to the mouth of the Pecos, and south-westward, April—October.

My friend Dr. Gray, who has lately revised the North American genera of Nyctaginaceæ and the species of Mirabilis and Oxybaphus, has furnished me with the following conspectus.

J. T.

1. MIRABILEÆ. Involucrum calyciforme, gamophyllum, 1–12-florum. Stigma capitatum, granulatum.

* Anthocarpium symmetricum, apterum. Involucrum 5-fidum.

MIRABILIS, *Linn.* Anthocarpium læve, haud angulatum, ecostatum aut vix costatum, ovoideum. Involucrum herbaceum, post anthesin vix mutatum. Stamina sæpissime 5.

OXYBAPHUS, *L'Her.* Anthocarpium 5-costatum, obovatum vel clavatum, costis validis. Involucrum post anthesin auctum, rotato-explanatum, scariosum, reticulatum. Stamina sæpissime 3.

** Anthocarpium læve, hinc excavatum, marginibus alæformibus rigidis plerumque dentatis

inflexis, in centro linea duplici tuberculorum. Involucrum tripartitum, triflorum, fructiferum haud scarioro-explanatum.

ALLIONIA, *Linn.* pro parte, *Chois.* (This genus should: by right, have borne the name of Wedelia, *Lœfl.*, and Oxybaphus that of Allionia, *Lœfl.*) Although the number of parts in the involucre may well be more important than the number of flowers it incloses as Choisy remarks, yet the principal character of Allionia is in the fruit.

2. ABRONIEÆ. Involucrum polyphyllum, perfectum, e bracteis discretis 5–15, capitulum multiflorum fulcrans. Stigma capitatum vel lineari-clavatum.

NYCTAGINIA, *Choisy.* Perigonium tubuloso-infundibuliforme, lobis integris. Genitalia longe exserta. Anthocarpium nuciforme Mirabilis, ecostatum.

ABRONIA, *Juss.* Perigonium hypocraterimorphum, lobis obcordatis. Genitalia inclusa. Anthrocarpium perfectum 5-peterum. Embryo abortu monocotyledoneus.

3. ACLEISANTHEÆ. Involucrum imperfectum, e bracteolis 2–3 parvis ad flores singulos, vel nullum. Stigma læve, peltatum seu pileiforme.

SELINOCARPUS, *Gray.* Anthocarpium alatum, alis 5 vel abortu 3 aveniis.

ACLEISANTHES, *Gray.* Anthocarpium et perigonium (longe tubulosum) Mirabilis.

PENTACROPHYS, *Gray.* Anthocarpium cylindricum, 5-costatum, costis apice glandula sæpius tumida instructis.

BŒRHAAVIA. Anthocarpium nunc 5-costatum vel angulatum, nunc 10-costatum. Flores sæpius paniculati vel racemosi.

MIRABILIS, *Linn.*

§ 1. NYCTAGE, *Royen.* Involucrum uniflorum. Perigonium longe tubulosum vel infundibuliforme. Flores ampli.

M. JALAPA & M. LONGIFLORA, *Linn.*, cum variis.

§ 2. QUAMOCLIDION, *Choisy.* Fere præcedentis, sed involucrum 3–12-florum.

M. TRIFLORA, *Benth. Pl. Hartw.* Quamoclidion nyctagineum, *Choisy.*

M. MULTIFLORA. Oxybaphus multiflorus, *Torr.* Quamoclidion multiflorum, *Torr.*, etc.

§ 3. OXYBAPHOIDES. Involucrum 1–3-florum. Perigonium e tubo brevi late infundibuliforme. Flores pro genere parvi.

M. OXYBAPHOIDES. Quamoclidion oxybaphoides, *Gray in Sill. Jour.* (*ser.* 2,) 15, *p.* 320. Involucrum triflorum, 5-partitum, fructiferum tenui-membranaceum. Stam. 3.

M. CALIFORNICA. Oxybaphus lævis, *Benth. Bot. Voy. Sulph. p.* 44? O. glabrifolius, var. crassifolius, *Choisy in DC. Prodr.* 13, *p.* 431. O. glabrifolius, *Torr. Bot. Whipp. Rep. p.* 131, non *Vahl.* Aut glabra, aut viscoso-villosa, foliis parvis subcordatis. Involucrum uniflorum, 5-fidum. Stam. plerumque 5. (This cannot be Oxybaphus ovatus, which is said to have "semen obovatum læve," for it is also said to have the involucrum "crescentes in membranam venoso-reticulatam patentissimam." *R. & P.*)

OXYBAPHUS.

The two sections founded on the number of the flowers in the involucre are of small value in this genus. Betero's No. 495, referred by Choisy to O. ovatus, and probably (with Calyxhymenia ovata, *R. & P.*?) only a form of O. viscosus, exhibits two if not three flowers in the same involucre. No. 511 of Dr. Gregg's Mexican Collection is in the same case, and is pretty clearly O. viscosus notwithstanding. And I think that Wright's No. 605, with glabrous and papillose-

tuberculate fruit, is only a similar state of O. glabrifolius. The 3-flowered species occasionally bear four or five flowers.

Our species are exceedingly variable, and hard to fix by characters. The tubercles or papillæ develope variously in the same species, and they also change after wetting, deliquescing more or less into mucilage. The earlier flowers of O. nyctagineus, and probably of other species, are apt to fructify precociously.

I can understand our species only as follows:

§ 1. Perigonium breve, subcampanulatum seu rotato-infundibuliforme, involucrum paullo superans.

* Anthocarpium glabrum secus vel etiam inter costas sæpissime tuberculatum. Involucrum 1–3-florum.

O. VISCOSUS et O. GLABRIFOLIUS, Mexico.

O. GLABRIFOLIUS, *Vahl.*: var. involucro 2–3-flora. Texas, in mountain valleys near the Rio Grande, below El Paso; No. 605, *Wright.*

O. AGGREGATUS, *Vahl.* Mirabilis aggregata, *Cav. Ic.* 5, *t.* 437. Smith's Run, western Texas; No. 1717, *Wright.* Certainly the plant of Cavanilles, and found north of Mexico by no other collector.

** Anthocarpium pubescens. Involucrum semper 3–5-florum.

O. NYCTAGINEUS, *Sweet.* Allionia nyctaginea, *Michx. Fl.* 1, *p.* 100. Folia omnia (nisi summa diminuta) petiolata, basi obtusa vel cordata. Fructus hirsutulus, inter costas nunc leviter subreticulato-rugosus.

Var. *α* LATIFOLIUS: usque ad involucrum fere glaber seu glaberrimus; foliis ovatis cordatisve submembranaceis, facie Mirabilis. Allionia nyctaginea, *Michx.* Wisconsin to Texas and New Mexico. No. 741, *Fendler;* 603, *Wright;* 681, (1847–8,) *Lindheimer,* &c. This needs to be compared with O. violaceus, a Linnæan species, of which I have no sufficient specimens.

Var. *β* CERVANTESII: ramulis involucrisque viscoso-pubescentibus seu villosis; foliis plurisque minoribus et crassioribus sæpius obtusis cordatis vel basi subcordatis. O. Cervantesii, *Lag. ex Choisy, l. c.* New Mexico and Texas to Mexico. No. 912, *Coulter;* 742, *Fendler;* 1719 and 1720, *Wright.* No. 1719, in part, and 1721, *Wright,* an intermediate between *α* and *β*.

Var. *γ* OBLONGIFOLIUS: foliis ovato-lanceolatis oblongisve crassis basi haud cordatis; cæt. var. *β*. Allionia ovata, *Pursh, Fl.* 1, *p.* 97. Oxybaphus floribundus, *Choisy, l. c.* A mere form of the last. No. 604, *Wright;* 2004, *Berlandier,* &c.

Var. *ε* PILOSUS: undique viscoso-hirsutus; cæt. var. *β* & *γ*. Calymenia pilosa, *Nutt. Gen.* 1, *p.* 26. Upper Missouri to New Mexico. No. 1718, *Wright;* between this and var. *β*. Rio Mimbres, &c.; *Bigelow.*

O. ALBIDUS, *Sweet; Choisy, l. c.* Allionia albida, *Walt. Fl. Car. p.* 84. Calymenia albida, *Nutt.* Oxyb. pilosa? *Engelm. & Gray, Pl. Lindh. l. c. p.* 51. Præter inflorescentia glabella. Folia omnia subsessilia, lanceolata seu oblongo-lanceolata, basi acuta. Fructus magis hirsutus quam in O. nyctagineo, secus vel inter costas muriculatus. North Carolina to Texas. *Hook. Fl. Bot. Am.* 2, *p.* 124.

O. HIRSUTUS, *Sweet; Choisy, l. c.* Allionia hirsuta, *Pursh, Fl.* 2, *p.* 728. Calymenia hirsuta, *Nutt. l. c.* Saskatchewan to northwestern Texas; on the Limpio; *Bigelow, Wright.* Subpedalis, undique hirsutus. Folia lanceolata, crassa, inferiora breviter petiolata. Fructus O. nyctaginei. The broader-leaved states approach var. *ε* of O. nyctagineus; the narrow ones becoming glabrate may pass into the next species.

O. ANGUSTIFOLIUS, *Sweet; Choisy, l. c.* (pro parte.) Colymenia angustifolia, *Nutt.* C. decumbens, *Nutt.* Allionia linearis, *Pursh, l. c.* Folia linearia, sæpius elongata, repanda, crassa, glaucescentia, cum caule 1–6 pedali glaberrima. Pedunculi et involucra pubescentia. Fructus cinereo-pubescens. Upper Missouri to the Rocky mountains, New Mexico, and Texas. No. 745, *Fendler;* 606, 607, 1822, *Wright.*

§ 2. Perigonium angustius infundibuliforme, involucro quadruplo longius. Anthocarpium clavato-oblongum, apiculatum, pubescens, inter costas validas profunde sulcatum.

O. COCCINEUS, *Torr. ined.* Species habitu præcedentis, floribus et fructu distinctissimum. New Mexico.

POLYGONACEÆ.

ERIOGONUM HIERACIFOLIUM, *Benth. in DC. Prodr.* 14, *pars* 1, *p.* 6. Hillsides, along the cañons of Rio Grande, above the mouth of the Pecos; *Parry.* Western Texas, near the Rio Grande; *Wright*, No. 616. A well-marked species, but allied to E. alatum, from which it is easily distinguished by the achenium being winged only above the middle, and not at all below. It is commonly about a foot and a half or two feet high. The sepals are nearly equal, and vary from yellowish to rose color. Pedicels articulated close to the flower. Bracteoles linear, glabrous. Embyro excentric and a little curved.

ERIOGONUM ALATUM, *Torr. in Sitgreave Rep. p.* 168, *t.* 8; *Benth. l. c.* Hills near the Copper Mines, New Mexico; also near Cruces, June—July; *Bigelow, Thurber*, (No. 225.) Some of the specimens are more than four feet high.

ERIOGONUM CILIATUM (*Torr.*; *Benth. l. c.*): herbaceum, perenne; caule nudo tereti glabro parce dichotomo-ramoso; foliis radicalibus obovatis obtusis cum acumine brevissimo basi in petiolum attenuatis supra glabris, subtus pilosiusculis margine ciliatis; pedunculis elongatis; involucris campanulatis 5-fidis; perigoniis subcoriaceis semisexfidis, laciniis ovatis erectis, interioribus paullo longioribus angustioribusque; achenio triquetro perigonio fructifero subæquali. Sandy soil near Buena Vista, Cohahuila, July; *Dr. Edwards.* Near Monterey, in the same State; *Gregg.* Root perennial; leaves in a subradical cluster from a short divided caudex, 1½ to 2½ inches long (including the petiole) and six to ten lines wide. Stems, several from one root, 12–15 inches high, slender, two to three times forked, the terminal divisions bearing a solitary involucre which is about two lines in diameter. Flowers very numerous, the pedicels jointed close to the flower. Bracteoles narrowly linear, fringed with long hairs. Perianth purple, of a coriaceous (or probably, in the living plant, of a fleshy) texture; the segments extending scarcely below the middle, rather obtuse; the entire base showing six obtuse ridges. Stamens included, six of them alternating with the segments, the other three opposite the inner segments and inserted considerably lower down; filaments smooth. Ovary triangular; styles very short. Achenium enclosed in the connivent perianth, triquetrous, smooth. Embryo incurved, excentric. On high plains near San Juan de la Vagueria, Dr. Gregg found an Eriogonum that seems to be a variety of this species, but it differs in the following characters: var. FOLIOSUM: caule scabriusculo 2–3-chotome ramoso, axillis foliosis. Plant about a foot high, more branched than the preceding; the radical leaves smaller, less ciliate, and of a somewhat fleshy texture. Cauline leaves about three quarters of an inch long; smooth. Peduncles one to one and a half inch long. Sepals united to the middle, closing around the fruit.

ERIOGONUM LONGIFOLIUM, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 164; *Benth. l. c.* Mountains and plains near Live Oak Creek, September; *Bigelow.*

ERIOGONUM JAMESII, *Benth. l. c.* Hill sides and arroyas on the upper Rio Grande and its tributaries.

ERIOGONUM FASCICULATUM, *Benth. in Linn. Trans.* 17, *p.* 411, *& in DC. Prodr. l. c.* Near San Felipe, etc., California; *Parry, Schott.*

ERIOGONUM POLIFOLIUM, *Benth. in DC. Prodr. l. c.* Sandy hills, San Felipe; *Thurber*, (No. 587,) and near San Diego, California; *Parry.* Dr. Andrews found it also at Monterey. On the lower Gila; *Schott.* This species forms bushy tufts one to two feet in diameter.

ERIOGONUM WRIGHTII, *Torr.; Benth. l. c. p.* 15. Hill sides, Copper Mines, and along the Rio Grande from Albuquerque to the great cañons; frequent. Dry plains, Los Playas, Sonora, June; *Thurber.* Var. HELIANTHEMIFOLIUM. E. helianthemifolium, *Benth. l. c.* Pine mountains east of San Luis Rey, California; *Parry.*

ERIOGONUM VIRGATUM, *Benth. in DC. Prodr. l. c. p.* 16. Grassy places near San Luis Rey, California; *Parry.* This agrees very well with the original specimens of Frémont, named by Bentham.

ERIOGONUM GRACILE, *Benth. Bot. Sulph. p.* 46. Sandy ravines, Sonora, September; *Thurber.*

ERIOGONUM ACETOSELLOIDES, *Torr.; Benth. in DC. Prodr. l. c. p.* 16?. Near Santa Barbara, California, August; *Parry.* The flowers are smaller and on longer pedicels than in specimens collected in the United States Exploring Expedition.

ERIOGONUM VIMINEUM, *Dougl.; Benth. in Trans. Lin. Soc.* 17, *p.* 416. Sandy hills, San Felipe, California, May; *Thurber.*

ERIOGONUM MULTIFLORUM, *Benth. l. c.* Western Texas, along the lower Rio Grande to its mouth.

ERIOGONUM ANNUUM, *Nutt. l. c.; Benth. in DC. Prodr. l. c. p.* 19. E. cymosum, *Benth. l. c.* Alluvions of the Cibolo, a tributary of the Rio Grande, and rocky places, Howard's Springs, August—September; *Bigelow.*

ERIOGONUM TENELLUM, *Torr. in Ann. Lyc. New York,* 2, *p.* 241; *Benth. l. c.* Mountains below San Elceario, and at the mouth of the Great Cañon of the Rio Grande; *Bigelow, Parry;* also on the San Pedro, western Texas. (Nos. 619 and 1767, *Wright.*) Some of our specimens are two feet high.

Var. β PLATYPHYLLUM. E. platyphyllum, *Torr.; Benth. l. c.* On the Rio Grande, western Texas. (Nos. 618 and 1768, *Wright.*) Intermediate forms show a gradual transition from this variety to E. tenellum.

ERIOGONUM TRICHOPODUM, *Torr.; Benth. l. c.* Dry ravines and rocky banks, along the Rio Grande from El Paso to the Great Cañon, and west to the Colorado of California. The leaves are all radical, orbicular, or roundish-ovate, cordate, on petioles much longer than the lamina.

ERIOGONUM CORDATUM, *Torr.; Benth. l. c.* Near San Felipe, on the borders of the California desert; *Parry.*

ERIOGONUM THURBERI (n. sp.): annuum, humile, arachnoideo-lanosum; foliis subradicalibus longe petiolatis late ovatis obtusis subcordatis rugosis, margine subundulatis, subtus incano-tomentosis; caule superne divaricato 2–3-chotomo; pedunculis elongatis capillaribus; involucris late campanulatis 5–6-fidis paucifloris; perigoniis glabris profunde 6-fidis, laciniis exterioribus superne reniformi-dilatatis medio constrictis; interioribus oblongo-subpanduriformibus. Sandy ravines, San Pasqual, California, May; *Thurber.* I have seen specimens of this plant collected in California by Mr. Wallace. Leaves in a subradical cluster, about half an inch long undulate-rugose, pubescent above, white-tomentose underneath. Stem a scape about a span high trichotomously subdivided below the middle, with ovate acute ternate bracts at the forks. Pedicels an inch long. Involucre less than a line in diameter, cleft nearly to the middle into six rather obtuse lobes; exterior segments of the perianth nearly four times broader than the inner. Filaments and ovary smooth. Styles short. Achenium smooth. Embryo strongly curved. No bracteoles were detected; in their place are only woolly hairs. Resembles E. rotundifolium in the flowers; but that species has numeous stems, which branch near the root, even leaves; much shorter stout peduncles, and manifest bracteoles.

ERIOGONUM ROTUNDIFOLIUM, *Benth. l. c.* Rocky ravines along the Rio Grande from El Paso to Santa Barbara, and west to Santa Maria, Cohahuila, April—June. (No. 1765, *Wright.*)

ERIOGONUM CERNUUM, *Nutt. Pl. Gamb. in Jour. Acad. Sc. Phil. n. ser.* 1, *p.* 162; *Benth. l. c.* On the Gila; *Schott.*

ERIOGONUM ABERTIANUM, *Torr. in Emory's Rep. p.* 151; *Benth. l. c.* Sandy soils, valley of the upper Rio Grande; westward along the Gila, and in Chihuahua. Variable in height and breadth of leaves, but always easily recognized. (Nos. 620, 621, 622, 1761, 1762, 1763, *Wright.*)

ERIOGONUM PHARNACEOIDES, *Torr. in Sitgreave's Rep. p.* 167, *t.* 11; *Benth. l. c.* Hills near the Copper Mines; *Bigelow.* Near Janos, Chihuahua; *Thurber.*

CHORIZANTHE ANGUSTIFOLIA, *Nutt. l. c.*; *Benth. l. c.* Near Monterey, California, on the sandy beach, May; *Parry.*

CHORIZANTHE DIFFUSA, *Benth. Pl. Hartw. p.* 333, *& in DC. Prodr. l. c.* With the last; *Parry.*

CHORIZANTHE PROCUMBENS, *Nutt. l. c.; Benth. l. c.* San Diego, California, May; *Thurber.*

CHORIZANTHE BREVICORNU (n. sp.): annua; foliis radicalibus anguste-spathulatis hirsutis; caulibus subnudis erectis 2–3-chotome ramosis; cymis laxe corymboso-paniculatis; involucris glabriusculis anguste tubulosis, dentibus subæqualibus subulato-aristatis recurvis tubo triplo-brevioribus, perigonii laciniis integris acutiusculis æqualibus. On the Gila River, *March; Parry,;* also collected by Colonel Frémont on the same river. Plant 1–4 inches high. Leaves scarcely a line wide, rather acute. Bracts subulate. Involucre about 3 lines long, a little curved, the teeth scarcely uncinate. Stamens only 3 in all the specimens examined. Near C. staticoides, but with a much looser inflorescence, shorter involucral teeth, equal perianth-segments and only 3 stamens.

CHORIZANTHE FIMBRIATA, *Nutt. l. c.; Benth. l. c. Torr. in Pacif. R. Road Expl.* 6, *p.* 362, *t.* 8. "Dry hills around San Diego, California, in such profusion as to give them a red appearance;" *Thurber.*

ACANTHOGONUM RIGIDUM, *Torr. in Bot. Whippl. Rep. p.* 133, *& in Bot. Parke's Rep. t.* 8. Desert west of the Colorado, California, March; *Schott.*

MUCRONEA CALIFORNICA, *Benth. in Linn. Trans.* 17, *p.* 419, *t.* 20, *& in DC. l. c. p.* 27. Dry hills near San Diego, California; *Parry.* In our specimens the involucres are all 3–4-toothed.

CENTROSTEGIA THURBERI, *Gray, in DC. Prodr. l. c. p.* 27; *Torr. in Bot. Parke's Rep.* 7, *p.* 19, *t.* 8. Sandy hills near San Felipe, California, May; *Thurber, Antisell.*

PTEROSTEGIA DRYMARIOIDES, *Fisch. & Mey. Ind.* 2, *Sem. Hort. Petrop. p.* 48; *Benth. l. c.* San Pasqual, and Napa, California, May; *Thurber.* Mr. Thurber's specimens from Napa resemble those collected by Dr. Bigelow near San Gabriel, in which the leaves are 2-cleft with variously cut segments.

RUMEX HYMENOSEPALUS (n. sp.): glaberrimus; foliis ovato-lanceolatis basi angustatis margine subundulatis; panicula aphylla, racemis elongatis erectis, verticillis approximatis multifloris;

pedicellis capillaribus valvas æquantibus; valvis lato-cordatis membranaceis integerrimis ecallosis. Sandy soils from El Paso to the cañons of the Rio Grande; March—April. Root white. Stem 2–3 feet high. "Foliage intensely bitter;" *Thurber*. Lower leaves a foot or more long and 2–3 inches wide, somewhat undulate on the margin; upper ones nearly flat. Panicle a foot long; the flowers crowded. Inner sepals of the fructiferous calyx nearly half an inch long, roundish-ovate, strongly cordate, of a very thin texture, often rose-colored, slightly reticulate-veined, twice as long as the achenium. We cannot refer Rumex to any described species. It is nearest R. venosus, but that is a smaller plant, the leaves with a much longer and more attenuated base, the panicle lax, and with but few flowers in whorls, and the valves are a great deal larger, as well as broader in proportion.

RUMEX SALICIFOLIUS, *Weinm. in Flora*, 1821, *ex Meisn. in DC. Prodr.* 14, *pars* 1, *p.* 47. Banks of the Rio Grande near Frontera, Texas; April. (No. 1780 and 1781, *Wright.*)

Var. DENTICULATIUS: valvulis lato-deltoideis denticulato-serrulatis vix callosis. Near San Diego, California; *Thurber*. Probably a distinct species.

RUMEX MARITIMUS, *Linn.; Meisn. l. c. p.* 59. Moist sandy places near San Luis Rey, Calfornia; *Parry*.

POLYGONUM AVICULARE, *Linn. Sp. p.* 519; *Meisn. l. c. p.* 97. Western Texas; *Wright*, No. 1774 and 1775; the latter a tall erect slender form with narrowly lanceolate leaves.

POLYGONUM PARONYCHIA, *Cham. & Schlecht. in Linnæa*, 3, *p.* 51. *Meisn. l. c. p.* 89. Near Monterey, California; on the sea beach, April; *Parry*. San Francisco, March; *Thurber*.

POLYGONUM CAMPORUM, γ BOREALE, *Meisn. in Mart. Fl. Bras. fasc.* 14, *Polyg. p.* 22; *& in DC. Prodr.* 14, *pars* 1, *p.* 87. Dry bed of the Sea Willow, Texas, August; *Bigelow*. Mouth of Los Moros; *Schott*. (No. 614, *Wright.*) Stems 3–4 feet long, simple below, apparently arising from a creeping rhizoma, the branches elongated, terete, terminating in long slender interrupted spikes; bracts 2–4-flowered, the lower ones remote and sometimes with small oblong leaves in the axils, the upper somewhat approximated. Flowers on exserted pedicels. Perianth pale rose color or white, not punctate. Achenium triquetrous.—Allied to P. scoparium of Corsica.

POLYGONUM TENUE, *Michx. Fl.* 1, *p.* 238; *Torr. Fl. N. York*, 2, *p.* 153. Hill sides, Santa Rita del Cobra, Aug.; *Bigelow*. (No. 1776, *Wright.*)

POLYGONUM ACRE, *H. B. K.; Meisn. l. c. p.* 107. P. hydropiperoides, *Pursh*, non *Michx*. Between El Paso and Doña Ana, on the Rio Grande, April; also on the Mimbres; *Bigelow*. (No. 1777, *Wright.*)

POLYGONUM HYDROPIPEROIDES, *Michx. Fl.* 1, *p.* 239; *Meisn. l. c. p.* 103. Brady's Creek, western Texas, October; *Thurber*.

POLYGONUM NODOSUM, *Pers.* var. INCARNATUM, *Gray, Bot. N. States, ed.* 2, *p.* 372. P. incarnatum, *Ell.* With the last. Wet ravines below San Elceario on the Rio Grande; *Bigelow*. Western Texas; *Thurber*.

POLYGONUM PENNSYLVANICUM, *Linn. Sp.* 1, *p.* 519; *Meisn. l. c.* Low grounds near San Elceario Texas; *Bigelow*. Sonora; *Thurber, Capt. E. K. Smith*.

POLYGONUM PERSICARIA, *Linn.; Meisn. l. c.* Wet places; Valley of the Limpio, etc.

POLYGONUM AMPHIBIUM, *Linn.; Meisn. l. c.* Var. TERRESTRE. Presidio del Norte; *Bigelow* (a nearly glabrous form.) Santa Cruz river, Sonora; *Capt. E. K. Smith*. (No. 1779, *Wright*.

BASELLACEÆ.

Anredera scandens, *Moq. in DC. Prodr.* 13, *pars* 2, *p.* 230. Basella vesicaria, *Lam. Dict.* 1, *p.* 382. Alluvions of the lower Rio Grande, below Roma, September—October; *Schott.* A very common vine in the thorny "chapparal," twining profusely on every fence and hedge near Corpus Christi; *Dr. Edwards.*

AMARANTACEÆ.

Acanthochiton Wrightii, *Torr. Bot. Sitgr. Rep. p.* 170, *t.* 13. Plains among the Burro mountains, September; *Bigelow.* Los Medanos, Chihuahua, August; *Thurber.* These specimens are very perfect and enable us to amend the character of Acanthochiton given in the work here quoted. There are three somewhat unequal bracts to each male flower. The cells of the anthers are separate at the summit, and very acute. The female flowers are mostly ternate and are subtended by three bracts, the middle one of which is cordate-falciform and usually much larger than the lateral ones.

Celosia paniculata, *Linn. Sp. p.* 298; *Moq. in DC. Prodr.* 13, 2, *p.* 240. Shady woods near Eagle Pass, on the Rio Grande; also on the San Pedro river, western Texas, August—November; *Bigelow.* (No. 594, *Wright.*) A common plant in subtropical America. Dr. Edwards found it at Corpus Christi, and Mr. Blodgett at Key West.

Amarantus hybridus, *Linn. Sp. p.* 1406; *Moq. l. c. p.* 259. On the Rio Grande, and along the Gila. (No. 1648, *Wright.*) Probably not indigenous.

Amarantus Blitum, *Linn. l. c.; Moq. l. c.* Low places, near Camp Bache, July; *Bigelow.* Introduced from Europe?

Sarratia Berlandieri, *Moq. l. c. p.* 268. Mountains of the Cibola, a tributary of the Rio Grande, August; *Bigelow* Our specimens are about 18 inches high, which is three times taller than Berlandier's plant, as described by Moquin.

Sarratia Berlandieri, var. emarginata: foliis oblongo-lanceolatis; calycis fœminei lacinis lato-cuneatis, emarginatis. Camp Green, October; *Parry.* This variety is about a foot high. Except in the laciniæ of the perianth, it does not appear to differ from the preceding.

Sarratia Berlandieri, var. denticulata: foliis lineari-lanceolatis, calycis fœminei laciniis lato-cuneatis margine eroso-denticulatis. Santa Cruz, Sonora, September; *Thurber.*

Sarratia Berlandieri, var. fimbriata: foliis linearibus; glomerulis subglobosis densifloris, inferioribus axillaribus superioribus approximatis subspicatis; calycis fœminei laciniis æqualibus flabellato-cuneiformibus apice dentato-fimbriatis. On the Gila river; *Schott.* (No. 582, *Wright.*) Stem 2 feet or more in length, smooth, branching; the branches erect. Leaves 1½–2½ inches long, 1½–2 lines wide, smooth, tapering at the base. Glomerules of flowers about one-third of an inch in diameter, the upper ones aggregated in a long naked spike. Bracts subulate. Perianth parted nearly to the base; the segments spreading, mostly broader than long, abruptly narrowed to a short claw, the summit cut into irregular acute teeth or laciniæ. Ovary globose ovate; stigmas 3–4. Utricle tubercular-rugous at the summit. Seed lenticular, acute on the margin, smooth, and shining. This appears to be quite a distinct species.

Amblogyna polygonoides, *Raf.; Moq. l. c. p.* 270. Amarantus polygonoides, *Linn.* Western Texas, (No. 1746, *Wright.*) We have it also from Dr. Gregg, who collected it at Cerro Alto, Mexico. The genus Scleropus, of Schrader, is founded on an abnormal state of this plant, in which the peduncles and pedicels have become thickened and indurated. We have it in this state from Key West, collected by Mr. Blodgett, and from the vicinity of New Orleans, where it was found by Dr. Riddell. Even some of Berlandier's specimens, which Moquin referred to Scleropus, are in the ordinary state of Amblogyna polygonoides.

Montelia tamariscina, *Gray, Man. Bot. ed.* 2, *p.* 370. Amarantus tamariscinus, *Nutt. in Trans. Amer. Phil. Soc.* (*n ser.*) 5, *p.* 165. Ravines Rio San Pedro, western Texas, September; *Bigelow,* who collected only the male plant; while Wright (under No. 1747) has both sexes.

Guilleminea densa, *Moq. l. c. p.* 338. Plains between the Limpio and the Rio Grande; also near the Copper Mines, July—August; *Bigelow.* Sonora; *Thurber.* On the banks of the Colorado, California; *Schott.* (Nos. 584, 585, and 1755, *Wright.*) Mr. Thurber's plant exactly accords with the description of Moquin, l. c.; but our specimens from the other collections have broader leaves.

Gossipianthus rigidiflorus, *Hook. Ic. Pl.* 3, *t.* 251; *Moq. l. c. p.* 337. Western Texas. (*Wright,* Nos. 586 and 1754.) This plant occurs only in the collections of Mr. Wright. It is certainly the same as Drummond's, on which the species was founded. We have no original specimens of G. tenuiflorus for comparison, but we believe that it is not distinct from G. rigidiflorus. In our Drummondian specimens of the latter, the plant is in fruit and the stamens are withered. In the more complete ones of Mr. Wright the filaments are ovate-lanceolate, as they are described in G. tenuiflorus; and in both they are connate at the base. The relative length of the bracts and calyx depends on the age of the flower.

Iresine vermicularis, *Moq. l. c. p.* 340. Illecebrum vermiculatum, *Linn.* Lower Rio Grande, in alluvial soils, October, *Schott.*

Iresine diffusa, *Humb. & Bonpl. in Willd. Sp.* 4, *p.* 765; *Moq. l. c. p.* 345. Var. foliis ovato-oblongis; spiculis oblongis; calyce bracteis subduplo longiore; staminodiis subulatis staminibus alternantibus et triplo-brevioribus. Sonora and Chihuahua; *Thurber.* San Estaban, September; *Bigelow.* On the Rio Grande, near the Great Cañon; *Parry.* Perhaps not distinct from I. celosioides, to which, indeed, some other species of the section Iresinastrum might be referred; but we have not found staminodia in any other of this group.

All our specimens are female. No. 589, *Wright,* is the male plant, in which there are small subulate staminodia between the filaments; thus resembling Ireneis, of Moquin, a genus scarcely distinct from Iresine.

Alternanthera Achyrantha, *R. Br. Prodr. p.* 417; *Moq. l. c. p.* 358. Achyranthes repens, *Linn.; Ell. Sk.* 1, *p.* 309. Banks of the Rio Pecos; *Schott.* Bachimba, Chihuahua; *Thurber.* Matamoras; *Gregg.* Moquin refers Elliott's plant to Telanthera polygonoides, but it certainly belongs here.

Alternanthera lanuginosa, *Torr. in Emory Rep. p.* 150; *Moq. l. c. p.* 359, (pro parte.) Achyranthes lanuginosa, *Nutt. in Amer. Phil. Trans.* (*n. ser.*) 5, *p.* 166. Common in New Mexico and Sonora, flowering through the summer. (Nos. 591 and 1756, *Wright;* Nos. 726 and 727, *Fendler;* Nos. 835 and 2255, *Berlandier.*) In Emory's Report I noticed a remarkable character in the specimens examined. The flowers become imbedded in the branches on which they grow, so that when in fruit they are partly or wholly concealed; on which account I proposed to call it Endotheca. This character is, however, not constant, or is only seen in old specimens. Sometimes the short branches, with the cluster of flowers at the summit subtended by two or three leaves, will assume the appearance of a pedunculate head, furnished with an involucre The peduncle becomes thickened upward, as does likewise the confluent bases of the leaves, involving more or less the flowers. In the young state the plant is densely woolly with verticillate hairs, but is nearly smooth later in the season. The staminodia are merely obtuse lobes between the filaments, or are wanting altogether. According to Mr. Schott the Mexicans use a decoction of this plant as tea.

ALTERNANTHERA? SUFFRUTICOSA (n.sp.): cinereo-pubescens; caule suffruticosa erecto? ramosissimo; foliis inferioribus ovatis breviter petiolatis, superioribus verticillatis subternatis suborbiculatis sessilibus; glomerulis paucifloris axillaribus sessilibus; sepalis oblongo-lanceolatis versus apicem pilosis bracteis duplo longioribus. Mountains near Frontera and between the Pecos and the Limpio; *Wright*, No. 592 and 1757. This species is truly suffruticose; the stems (which seem to grow erect,) arise from a thick irregular woody base. The A. lanuginosa is always annual and diffuse; the leaves are larger, with a long abruptly attenuated base, and the glomerules are fewer flowered.

GOMPHRENA TUBERIFERA (n. sp.:) parce pilosa; radice tuberosa; caule erecto ramoso herbaceo; foliis lanceolato-linearibus sessilibus integerrimis mucronulatis cinereis; pedunculis elongatis simplicibus; capitulis globosis vel ovatis solitariis plerumque diphyllis; floribus nitidulis albo-roseis; calyce bracteis lateralibus subæquali; sepalis acutissimis uninerviis villosissimis. Rocky banks of the San Pedro and other tributaries of the Rio Grande, Western Texas and in New Mexico. (Nos. 593 and 1750, *Wright.*) Root fusiform, 1½–2 inches long and about one-third of an inch in diameter above, fleshy and farinaceous; stem 1–2 feet high, sparingly branched.

GOMPHRENA DECUMBENS, *Jacq; Moq. l. c. p.* 410. Lower Rio Grande, October; *Schott.* This agrees very well with specimens from Havana, named by Moquin.

GOMPHRENA GLOBOSA: var. ALBIFLORA, *Moq. l. c.* On the Cibola and other tributaries of the Rio Grande; *Bigelow, Schott.* Santa Cruz and Babocomori, Sonora, September; *Thurber.* (No. 1751, *Wright.*)

GOMPHRENA SONORÆ (n. sp.:) caulibus e basi lignosa ortis pilosis; foliis lanceolatis sessilibus pilosis pallide viridibus; capitulis terminalibus et lateralibus ovatis simplicibus vel 2–3 confluentibus 2–4-phyllis; floribus flavescenti-vel carneo-albidis; bracteis lateralibus dorso sursum angusto-cristatis calyce paullo longioribus, sepalis acutissimis uninerviis villosissimis; stylo ovario longitudine apice bifido. Mountains near Santa Cruz, Sonora, Mexico, September; *Wright*, (No. 1749,) *Thurber.* Stems simple or sparingly branched, slender, 1–2 feet high, sparingly clothed with appressed hairs. Leaves 1–1½ inch long, 3–5 lines wide, acute, the lower ones narrowed at the base. Axillary heads simple, sessile, about one third of an inch in diameter; terminal heads mostly composed of two or three closely aggregated smaller heads. Lateral bracts about one-fifth longer than the calyx, with a narrow serrated crest above the middle. Stamineal tube entire to the summit; antheriferous lobes very minute; the lateral ones liguliform, much shorter than the anthers. Style about as long as the ovary; stigmas cylindrical, acute, half as long as the style. This species occurs only in the collections of Wright and Thurber, and does not appear to have been hitherto described. It seems to be allied to G. agrestis, *Mart.*

GOMPHRENA CÆSPITOSA (n. sp.:) humilis; caulibus cæspitosis; caudice lignoso; foliis obovatis obtusis subsericeo-villosis, radicalibus basi attenuatis, caulinis binis subsessilibus; pedunculis brevibus simplicibus; capitulis terminalibus solitariis ovatis; floribus nitidis flavescenti-albis; calyce bracteis ecristulatis paullo longiore; sepalis obtusiusculis uninerviis villosissimis. Gravelly plains near the Organ mountains, New Mexico; also at the Copper Mines and near Mimbres, April—May; *Bigelow, Wright,* (No. 1572.) Cook's Springs, New Mexico; *Thurber.* Rio de Santa Cruz, &c., Sonora; *Schott, Capt. E. K. Smith* .No. 1753, Wright, is a glabrescent state of this species. Stem or rather caudex 1–2 inches long, thick and somewhat ligneous, throwing up a tuft of spreading or decumbent branches, which are 1½–4 inches long, and, when young, are densely clothed with a whitish pubescence. Radical leaves an inch or more in length, exclusive of the petiole, which is about an inch long; in the young state pubescent, with almost silky white hairs, but finally smoothish; cauline leaves similar, but with very short petioles, or nearly sessile. Heads about three-fourths of an inch long. Bracts very acute, thin and hyaline, entirely without a keel. Sepals somewhat rigid, extremely villous. Filaments united nearly to the summit; the lateral processes often reduced to small teeth, or sometimes almost wanting. Style deeply bifid.

FRŒLICHIA FLORIDANA, *Moq. l. c. p.* 420. Oplotheca Floridana, *Nutt. Gen. p.* 79; *Bart. Fl. N. Amer. t.* 59. On the Limpio and near Van Horn's Wells; *Bigelow.* Presidio del Norte; *Parry.* May—July.

FRŒLICHIA DRUMMONDII, *Moq. l. c.* Rio Coleto and near El Paso; *Thurber.* Sandy beach of the lower Rio Grande, April; *Schott.* Too near the preceding species, which, again, seems to be scarcely distinct from F. interrupta.

FRŒLICHIA GRACILIS, *Moq. l. c.* Oplotheca gracilis, *Hook. Ic. sub t.* 256. Alluvions of the Rio Grande and at the Copper Mines, August—October; *Bigelow.* On the Guadalupe river, Texas; *Schott.* Chihuahua and Sonora; *Thurber.* A smaller species than the two preceding.

CHENOPODIACEÆ.

TELOXYS CORNUTA, *Torr. Bot. Whippl. Exped. p.* 129. Hills and rocky places near Santa Rita del Cobra, October, (in fruit;) *Bigelow.* Some of the specimens are nearly two feet high.

CHENOPODIUM ALBUM, *Linn; Moq. l. c. p.* 71. Doña Ana, New Mexico, Sonora and Chihuahua, April—July; *Thurber.* (Nos. 1731 and 1732, *Wright.*)

CHENOPODIUM ANTHELMINTICUM, *Linn.; Moq. in DC. Prodr.* 13, *pars* 2, *p.* 73. Various places New Mexico and western Texas; probably introduced.

BLITUM BONUS-HENRICUS, *Reich.; Moq. in DC. l. c. p.* 68. In fertile grassy places near San Luis Rey; *Parry;* and near San Diego, California; *Thurber.* Doubtless introduced from Europe.

OBIONE CANESCENS, *Moq. in DC. Prodr.* 13, *pars* 2, *p.* 212. Abundant at the foot of San Diego Bay, California; *Parry.* It forms dense thickets, 3–5 feet high.

OBIONE HYMENELYTRA (*Torr. in Bot. Whippl. Exped. p.*129, *t.* 20): caule fruticoso ramosissimo, ramis inermibus teretibus; foliis subdeltoideo-orbiculatis vel basi truncatis grosse acuteque dentatis dense lepidoto-incanis; floribus dioicis; bracteis reniformi-orbiculatis membranaceis integerrimis basi coalitis, disco nudo. Desert of the Colorado and on the Lower Gila, in saline soils; *Schott.* A shrub apparently 2–3 feet high, the branches very crooked and interlaced. Leaves 1–1½ inch in diameter, the margin cut into coarse, more or less acute salient teeth. Male flowers in dense glomerules, which are collected into axillary and terminal paniculate spikes. Fructiferous bracts more than one-third of an inch in diameter, reticulately veined, only united at the base, the short pedicel tumid and spongy.

OBIONE ARGENTEA, *Moq. Chenop.* 76, *& in DC. Prodr. l. c. p.* 115. Atriplex argentea, *Nutt. Gen.* 1, *p.* 198. Valley of the Pecos, September; *Bigelow.* Annual; stem much branched and at length diffuse, the branches angular and flexuous, nearly smooth. Leaves triangular or somewhat deltoid, subsessile, often nearly entire but usually more or less toothed, membranaceous. Male flowers in glomerated interrupted terminal spikes; female flowers in sessile axillary clusters. Fructiferous bracts pedicellate, suborbicular, the margin acutely and often irregularly toothed, disk naked, or sometimes cristate with foliaceous appendages.

OBIONE CONFERTIFOLIA, *Torr. & Frém. in Frém. 2d Rep. p.* 318. Mountains near Laguna de Santa Maria, Chihuahua, April; *Bigelow.* Only the male plant was collected.

OBIONE RADIATA (n. sp.): caule erecto? herbaceo ramoso, ramis inermibus; foliis obovato-oblongis obtusissimis mucronulatis membranaceis integerrimis vel obsolete repando-dentatis basi attenuatis utrinque lepidotis canescentibus; glomerulis fœmineis axillaribus; bracteis sessilibus orbiculatis infra mediam coalitis margine radiatim denticulatis, disco inappendiculato carinulato. Alluvions of the Gila, Sonora, May; *Schott.* Stem apparently annual and about a span long; the branches flexuous. Leaves 8–12 lines long and 3–5 lines broad. Male flowers in small terminal spikes; female flowers in small axillary clusters. Fructiferous bracts almost exactly orbicular, very flat, 1½ line in diameter, neatly cut around the margin into very short acute teeth, the disk marked with a central, longitudinal, slightly prominent keel. We cannot identify this plant with any of the species of Obione described by Moquin; it is most nearly related to the following:

OBIONE ELEGANS, *Moq. l. c. p.* 113, var.? RADIATA. Rio Sta. Murin, Chihuahua, August; *Thurber.* Western Texas, (No. 571 and 1743.) We are not confident as to our determination of this plant. Our specimens are certainly annual; the leaves are rather obtuse than acute; the fructiferous bracts are scarcely pedicellate and they are united to the middle. The margin is cut into strong acute radiating teeth.

OBIONE ELEGANS, var.? TUBERCULOSA: foliis repando-denticulatis; bracteis orbiculatis, margine dentatis, disco tumido cartilagineo medio tuberculoso-dentatis. Western Texas; *Wright.* Plant about a foot high, apparently annual. Differs from the last, chiefly in the tumid fructiferous bracts, the disks of which, on each side of the median line, are furnished with 2–3 acute tubercles.

OBIONE ACANTHOCARPA (n. sp.): caule suffructicoso erecto ramoso, ramis subteretibus inermibus; foliis deltoideo-lanceolatis spathulatisve integris vel repando-dentatis densissime lepidotis incanis floribus dioicis; glomerulis interrupte spicatis, spicis masculis paniculatis terminalibus; bracteis demum ultra medium in thecam sessilem subglobosam subcartilagineam undique spinosam coalitis. Plains between the Burro mountains; September, *Bigelow,* (in fruit.) On the Rio Grande, below Presidio del Norte; *Parry.* Near the Piloncilla, Sonora, September; *Thurber.* (No. 1739; *Wright.* His No. 1737 seems to be a slender form of the same.) Plant 1–2 feet high, much branching from the ground. Leaves somewhat persistent, about an inch long, often somewhat hastate at the base, usually somewhat repand-dentate or denticulate. Fertile flowers glomerate in the upper axils, forming a kind of leafy panicle. Male spikes paniculate, nearly naked. Fructiferous bracts indurated, covered with long flat or compressed rigid processes which resemble spines. Near Fort Yuma, California, Major Thomas collected an Obione which appears to be a variety of this species. It sometimes attains the height of 6–10 feet. The leaves are deltoid-ovate, very obtuse and somewhat undulate. Only the male plant was found. It is the same as O. Barclayana of Durand and Hilgard's Report of Williamson's Expedition, but apparently not of Bentham.

OBIONE CANESCENS, *Moq. in DC. Prodr.* 13, *pars* 2, *p.* 212. Abundant at the foot of San Diego Bay, California; *Parry.* Valley of the Rio Grande, from El Paso to Eagle Pass; also on the Gila. (No. 1740 and 1741, *Wright.*) A variety with smaller, ovate or obovate leaves was found on the Burro mountains by *Dr. Bigelow;* and on the Gila by *Mr. Thurber.* It is the same as Wright's No. 1738, and Berlandier's No. 1346; the latter from San Luis Potosi. Gregg found it also at Cerros Bravos, Mexico.

OBIONE OCCIDENTALIS, *Moq. l. c.* Near the Copper Mines and at Santa Barbara; also on the San Pedro; *Bigelow.* On the Pecos and in Chihuahua; *Thurber.* El Paso; *Wright.* Remarkable for its large broadly 4-winged fruit. These wings are either entire or more or less deeply toothed; rarely cut into narrow lobes. The bracts adhere nearly to the summit, while in O. canescens they are united only toward the base.

OBIONE OCCIDENTALIS, var. ANGUSTIFOLIA: foliis angusto-linearibus vel lanceolato-linearibus. Valley of the Rio Grande, from El Paso to 40 miles below San Elceario; *Bigelow, Wright.* On the Gila; *Thurber.* (No. 1742, *Wright.*) Gregg found it in various places in New Mexico, where it is called *Chanuzo.* It seems to be closely related to O. linifolia, *Moq.*

EUROTIA LANATA, *Moq. Chenop. p.* 81; *Torr. & Gray in Bot. Pope's Rep. p.* 124. Diotis lanata; *Pursh, Fl.* 2, *p.* 602. Hills near the Copper Mines, New Mexico.

CORISPERMUM HYSSOPIFOLIUM, *Linn.; Moq. l. c. p.* 141. Sandhills, Chihuahua; *Thurber.* Alluvions of the Rio Grande; *Schott, Parry.*

ARTHROCNEMUM MACROSTACHYUM, *A. Bunge in Linnæa,* 28, *p.* 573. Arthrocnemum fruticosum, γ macrostachyum; *Moq. Chenop. p.* 111, *& in DC. l. c. p.* 151. Salt marshes between Comanches and Leon Springs, November; *Schott.* Rio Pecos; *Thurber.* Santa Rosa, Cohahuila; *Bigelow.* Plant 1–2 feet or more in height. (No. 1745, *Wright.*) According to Bunge (*l. c.*) Moquin and Fenzl have not distinguished, by reliable characters, Arthrocnemum from Salicornia. To the former genus he refers those species in which the seed is albuminous, and the embryo curved; in the latter those which have exalbuminous seeds and a conduplicate embryo.

SALICORNIA MUCRONATA, *Lagasca Pl. Barill. ex Moq. Chenop. p.* 115. On the beach at Brazos Santiago, May; *Schott.* This plant is shrubby and apparently as tall as the preceding species; the specimen being only a branch, and more than a foot long. I am now inclined to regard it as distinct from S. mucronata of Bigelow, which is a humble annual with thicker spikes, and the flowers more deeply immersed in depressions of the rachis. The latter may be called S. Bigelovii.

SUÆDA MARITIMA, *Dumort.; Torr. Fl. New York,* 2, *p.* 141. Saline soils, Leon Springs, September; *Bigelow.* Plant apparently 3–4 teet high.

SUÆDA FRUTICOSA (*Forsk.*) var.? MULTIFLORA, *Torr. Bot. Whippl. Exp. p.* 130. Sandy hills and ravines near Presidio del Norte, August; *Bigelow.* Rio Pecos; *Thurber.*

PHYTOLACCACEÆ,

RIVINA LÆVIS, *Linn.; Moq. l. c. p.* 11. R. portulacoides, *Nutt. Trans. Amer. Phil. Soc., n. ser.* 5, *p.* 167. Common in alluvions throughout the valley of the Rio Grande and its branches below El Paso; west to Cocospora, Sonora. (Nos. 1729 and 1730, *Wright.*) The branches and leaves are sometimes more or less pubescent.

PHYTOLACCA DECANDRA, *Linn.; Moq. l. c. p.* 32. Mouth of the Rojo San Felipe, September; *Schott.* The specimens seem to belong to a depauperate form of the plant. The racemes are only 6–10-flowered.

LAURACEÆ.

OREODAPHNE CALIFORNICA, *Nees. Syst. Laur. p.* 463; *Torr. Bot. Whipple's Rep., p.* 133. In various parts of California, especially in mountainous districts; *Parry, Thurber.* Besides the popular names of the plant mentioned in the report here quoted, it is called Sassafras-Laurel, Cajeput Tree, and California Olive. The fruit varies from ovate or obovate to nearly globose.

SANTALACEÆ.

Comandra umbellata, *Nutt. Gen.* 1, *p.* 157. Var. angustifolia. C. pallida, β angustifolia, *Alph. DC. Prodr.* 14, *p.* 637. Hueco mountains and at the Copper Mines, New Mexico; also in western Texas, Chihuahua, and Sonora, April. (Nos. 783 and 784, *Wright.*) We have specimens that connect this variety with the ordinary form of the plant.

LORANTHACEÆ.

Phoradendron pauciflorum, *Torr. in Whipple's Rep. p.* 134. Sierra del Pajarito, Sonora; growing on Juniperus; *Schott.* Yanos; *Capt. E. K. Smith.*

Phoradendron Californicum, *Nutt. in Jour. Acad. Phil.* (*n. ser.*) 1, *p.* 185; *Torr. l. c.* On cotton-wood (Populus monilifera) along the lower Colorado of California, March and February; *Schott.* On mesquit trees (Algarobia glandulosa), borders of the Gila and near Eagle Pass, western Texas; *Parry, Schott.* Fructiferous spikes variable in length.

Phoradendron flavescens, *Nutt. l. c.* var. glabriusculum, *Engelm. in Gray, Pl. Lindh.* 2, *p.* 212. Common in the valley of the Rio Grande, on Algarobia (with male flowers only); *Schott.* On the Mimbres, in fruit; *Bigelow.* The male spikes vary considerably in length and in the number of their joints. Sometimes they exceed the leaves. The axis between the joints is thickly covered with flowers, sometimes to the number of 60 or more.

Var. pubescens, *Engelm. l. c.* Howard's Springs; *Bigelow.*

Phoradendron juniperinum, *Engelm. in Gray, Pl. Fendl. p.* 59. Near the Copper Mines, New Mexico; *Bigelow.* Howard's Springs; *Parry.*

Arceuthobium campylopodum, *Engelm. l. c.* On pine trees near Monterey, California; *Parry.* The fertile plant only was collected.

EUPHORBIACEÆ.

The genus Euphorbia has been kindly elaborated for this report by my friend George Engelmann, M. D.

§ I. ANISOPHYLLUM.

Euphorbia petaloidea: patulo-ramosissima; foliis oblongis oblongo-linearibus linearibusve retusis mucronatis; glandulis albo-appendiculatis; seminibus lævibus.

α. Nicolletii: foliis stylisque brevioribus; anthodiis cymulosis; seminibus ovatis.

β. intermedia: foliis angustioribus; stylis longioribus; anthodiis cymulosis.

γ. Nuttallii: foliis linearibus; anthodiis alaribus; appendiculis orbiculatis; stylis elongatis, seminibus subglobosis. E. arenaria, *Nutt. Pl. Arkans. p.* 171, *non H. B. K.*

δ. flagelliformis: priori similis, sed appendiculi minimi, styli breves. Of these varieties *α* and *β* have not been found within the districts explored by the Boundary Commission, but they probably occur there. The var. *γ* is common in Texas. Wright's 1826, belongs to var. *δ*, a New Mexican form.

Euphorbia serpens, *H. B. K.* E. herniarioides, *Nutt. l. c. p.* 171. In the southwestern parts of North America (abundant on the Mexican boundary line) and throughout Central and South America, but not in the eastern States. E. microphylla, *Roth*, from India, is the same plant.

Euphorbia revoluta (nov. spec.): erecto-patula; foliis linearibus revolutis obtusis basi subæqualibus, stipulis setaceis; anthodiis alaribus; glandulis anguste appendiculatis; stylis recurvis apice bifidis; capsula acute angulata, seminibus angustis acute angulatis transverse rugosis. (Gravelly hills near Rock creek; *Bigelow*. On the Rio Grande; *Wright*, No. 1830.) New Mexico; *Fendler*, No. 789. Very slender, 4–5 inches high; leaves 6–10 lines long and ½ line wide. Habit like a small slender E. petaloidea, but styles and seeds very different.

Euphorbia polycarpa, *Benth. Bot. Sulph. p.* 50. Dry soils near San Diego, California; *Parry, Schott*. Banks of the Gila; *Major Emory*. Sonora; *Wright*, No. 1854. This is a very variable plant, if all the forms which I refer to here really belong to it. Seeds smooth or undulate, appendages none, or small or large; plant smooth or pubescent, (and then always with short patulous hairs.) Collected by all the botanists from the upper Gila to San Diego. The only species of the section Anisophyllum which, so far as I know, has both smooth and pubescent forms, with the exception of E. hypericifolia.

Euphorbia Arizonica, (nov. spec.): erecto-patula; foliis e basi lata subæquali ovatis obtusis pilosis; stipulis inconspicuis; anthodiis alaribus longius pedunculatis; appendicibus glandula purpurea multo majoribus obovatis tubo turbinato postice fisso brevioribus; stylis erectis ad medium bifidis ovario puberulo longioribus, stigmatibus filiformibus; capsula pilosa; seminibus rugoso-verrucosis ad angulos acutos crenulatis. Sierra Yanos, Sonora, July; *Schott*. Stems 4–5 inches high; leaves 3–4 lines long, 2½–3 lines wide. Seed very small, involucrum with the appendage 1½ line in diameter.

Euphorbia pediculifera (nov. spec.): procumbens, cinereo-pubescens; foliis ovatis obtusiusculis; stipulis e basi lata lanceolatis; glomerulis parvifloris in ramulis alternis terminalibus; involucris hemisphæricis; glandulis magnis; appendicibus transversis crenatis; stylis patulis pubescentibus ad basin fere bifidis; stigmatibus divaricatis; capsula acute angulata pubescente, seminibus compressis angulatis sulcis 4 profundis transverse incisis. Sonora; *Wright*, (No. 1848,) *Schott*. Spreading 6–12 inches. Leaves 3–4 lines long, oblique. Involucrum large. Seeds 0.7 line long, deeply 5-lobed, similar to some insects.

Euphorbia Fendleri, *Torr. & Gray, Bot. Pope's Rep. p.* 19. E. rupicola, *Scheele in Linnæa*, 22, *p.* 153, *non Boiss.* Common in New Mexico and Western Texas; *Lindheimer, Wright, Bigelow*. Sonóra; *Thurber*. Variable in the form of the leaves and the shape or presence of the appendages.

Euphorbia albomarginata, *Torr. & Gray, l. c. p.* 18. Common in the whole region between western Texas and the Great Colorado, and southward into Mexico. It is No. 330 of Drummond's second Texan Collection.

Euphorbia cinerascens (nov. spec.): erecto-patula s. subdecumbens, pubescenti-canescens; foliis e basi lata obliqua ovatis s. suborbiculatis obtusis supra glabratis; stipulis lanceolatis minutis mox deciduis; glomerulis lateralibus; involucris canis; glandulis (plerumque purpureis) angustissimis marginatis; stylis brevibus pilosis; capsula acute angulata cana; seminibus ovatis acute angulatis læviusculis. On the Rio Grande; *Wright*. Chihuahua and Sonora; *Thurber*. Bishop's Hill, near Monterey, Mexico; *Gregg*.

β. appendiculata: foliis utrumque cinereis; appendicibus majoribus truncatis crenulatis; stigmatibus longioribus. San Felipe, California; *Dr. Le Conte, Thurber*; and San Gabriel, *Bigelow*. Stem 4–6 inches high; rounded leaves often tawny red, 1½–2 lines long; flowers

few. Mr. Thurber informs us that this plant is called *Yerba de la Golondrina* in Sonora. The Mexicans believe it to be a certain cure for the bite of a rattlesnake and other poisonous animals The bruised fresh plant or the dried, steeped in wine, is applied to the wound. A tincture of the plant is sometimes kept in the apothecarys' shops of that country. According to Dr. Gregg, the name Golondrina is applied to all the prostrate Euphorbiæ.

EUPHORBIA INÆQUILATERA, *Sonder in Linnæa*, 23, *p*. 105. I cannot distinguish from this plant of the Cape of Good Hope a species of the plains of Nebraska, Kansas, and Texas, and which extends into New Mexico, California, and Oregon. There it has been collected since the explorations of *Nicollet* and *Frêmont* by almost every traveller, (e. g., *Fendler*, 791, 795, 803; *Wright*, 666, 1823, (in part,) 1846.) The same plant has been sent from Florida by *Blodgett* and *Chapman*, is found on the West India Islands, is undoubtedly the E. Nilagirica, *Miq.*, of India, and has also been observed in New Holland; but it seems unknown in other States east of the Mississippi.

EUPHORBIA GLYPTOSPERMA (nov. spec.): erecto patula seu demum decumbens; foliis e basi valde obliqua (latere inferiore producta) æquilatis oblongis s. oblongo-linearibus obtusis versus apicem subserratis s. integriusculus; stipulis setaceis laciniatis, anthodiis alaribus demum in glomerulos laxos laterales confertis; appendiculis brevibus integris seu crenatis; stylis brevibus apice bilobis, stigmatibus subglobosis; seminibus ovatis argute rugosis ad angulos acutos crenatis. E. polygonifolia, *Hook. Fl. Bor. Am.* fide spec. auctoris *non Linn.*

β. TENERRIMA: foliis parvulis angustis apice vix crenulatis; involucri minuti glandulis vix seu non appendiculatis. On the Rio Grande; also on the Arkansas, and extending to the upper Missouri. (No. 1853, 1855, and 1856, *Wright.*) From a few inches to a foot high. The larger northern forms have leaves 3 to 6 lines long and 1 to 2 lines wide. In *β* the leaves are 1 to 3 lines long and ½ to 1 line wide; involucrum in the latter only 0.3 line long. Seed very sharply cross-ribbed, similar to that of *E. prostrata*, and notched at the angles.

EUPHORBIA STICTOSPORA (nov. spec.): erecto-patula, foliis e basi obliqua subcordata orbiculatis seu ovatis argute serratis supra subnudis; stipulis subulatis ciliatis; glomerulis lateralibus sessilibus; glandulis angustis appendiculatis; stylis ovario pubero brevioribus patulis indivisis; stigmatibus 3 capitatis; capsula puberula; seminibus angustis acute angulatis exsculpto-punctatis. From Kansas (*Fendler*, 798,) to Santa Fé (*Fendler*, 797) and Doña Ana, (*Wright*. 59,) New Mexico, and Corallitas, Chihuahua; *Thurber*. Stem 3–6 inches high. Leaves 2–4 lines long; apparently near *E. prostrata*, but styles and seeds very different.

EUPHORBIA PROSTRATA, *Ait.* This variable and often mistaken species is found from western Louisiana (*Dr. Hale*) to Texas; (*Lindheimer*, 533;) (*Berlandier*, 1100, 2530;) (*Wright*, 1848 in part, 1855 in part.) It seems to be a common plant in the West India islands, Mexico, and South America. It occurs in Africa and India. *Euphorbia tenella*, H. B. K., and *E. callibrichoides*, H. B. K., are forms of the same species, which can always be recognized by the ciliate angles of the capsule and the sharply rugose seeds, notched at the angles.

EUPHORBIA DIOICA, *H. B. K.* (E. anceps, *Benth.* E. callibrichoides; *Schauer*, etc.,) a common and very variable plant of Mexico, Central America, and the West India islands, has been collected by *Dr. Antisell* on the upper Rio Grande.

Var.? INDIVISA, distinguished by the annual root, the less coriaceous, less oblique and less distichous leaves, the more scattered involucra and the undivided styles; has been found near the Copper Mines, New Mexico, by Mr. Wright, (No. 1845) and in Sonora by Mr. Thurber, (No. 963.)

Euphorbia Serrula (nov. spec.): patula seu decumbens; caule patenter piloso; foliis e basi valde obliquo obtusiuscula seu subcordata oblongis sæpe falcatis obtusis argute grosseque serratis, subtus pilosis; stipulis lanceolatis laciniatis; glomerulis lateralibus appendicibus angustis integris seu crenulatis; stylis ovario glabro brevioribus patulis ad basis fere bifidis; seminibus ovatis lævibus costato-angulatis. Western Texas and New Mexico. (No. 658, 1843 and 1844, *Wright*. No. 796 and 804, *Fendler*.) Stems 4–6 inches long. Leaves 3–5 lines long, 1–3 lines broad, sharply and coarsely serrate; seeds larger than in all the foregoing species, 0.8 line long, remarkably angled.

Euphorbia villifera, *Scheele in Linnæa* 22, *p*. 153. Western Texas; *Berlandier*, 2084; *Lindheimer*, 530; *Wright*, *Thurber*. In various parts of Mexico; *Gregg*. Root annual, stems erect, often a foot high.

Euphorbia hypericifolia, *Linn. Sp*. 1, *p*. 454. New Mexico; *Wright*. (No. 1842 in part) Chihuahua; *Thurber*. The true Linnæan plant probably comes from the West Indies and other tropical countries, and has also been sent from Florida by Dr. Chapman. It is distinguished by smaller anthodia, generally disposed in denser clusters, smaller capsules and smaller paler seeds. The common North American form, which has also been collected abundantly along the boundary, has larger and more scattered anthodia, larger capsules and larger blackish seeds, and may be distinguished as var. *communis*, as it seems to be the more common form throughout the warmer countries around the whole globe.

Euphorbia pilulifera, *Linn*. *β* discolor: diffusa; foliis e basi valde obliqua ovatis subrhomboideis acutiusculus serratis, purpureo-maculatis, stipulis subulatis, capsula parvula pilosa, seminibus minutis ovatis acutis undulato-tuberculatis. Sonora; *Thurber*. *Wright*, No. 1842, in part. Mr. *Blodgett* found it in Florida. Stems ½–1 foot long. Leaves 1–1½ inch long; differs in shape and color of leaves from the usual forms of E. pilulifera; hair of the stem as in all forms of this species yellow and jointed; involucre only ½ line long; heads 3–4 lines in diameter; seed scarcely more than ⅓ line long.

Euphorbia capitellata (nov. spec.): annua, erectiuscula seu demum diffusa; caulibus elongatis puberulis; foliis e basi valde obliqua oblongo-linearibus subnudis argute serrulatis mucronatis; stipulis lanceolatis laceris; glomerulis densifloris terminalibus fere aphyllis; involucri glandulis longius stipitatis, appendiculis orbiculatis s. late obovatis integris; stylis ovario hirto longioribus ad medium bifidis; stigmatibus filiformibus divaricatis; capsula puberula; seminibus ovatis acutatis angulatis rugoso-tuberculatis. Valleys at San Bernardino, Sonora; *Wright*, (No. 1,849.) Stems 6–10 inches long; leaves 6–8 lines long, 2 lines wide; heads white, showy, 4–6 lines in diameter.

Euphorbia pycnanthema (nov. spec.): perennis, erecto patula, canescente-pubescens; foliis e basi lata obliqua cordata ovatis s. oblongis obtusiusculis sæpe mucronulatis integris s. subserrulatis, scabris; stipulis lanceolatis fissis; glomerulis terminalibus multifloris quasi involucratis; involucris pilosulis (primariis) late orbiculato-appendiculatis seu (secundariis) subnudis; stylis fere ad basis fissis patulis; stigmatibus divaricatis clavellatis; capsula subglobosa pubescente; seminibus acute angulatis transverse rugulosis punctatisque. Mountain sides near Lake Santa Maria, Chihuahua; *Wright*. Numerous stems 6 inches high, from a thick ligneous root; leaves 4–5 lines long. General appearance of a small labiate plant with terminal involucrate heads. similar in many respects to the last, but more erect, more hairy, leaves shorter. Remarkable for the different involucres on the same head, reminding one of Hydrangea or some Umbellifera.

Euphorbia lata. E. dilatata, *Torr. & Gray*, *Bot. Pope's Rep*. *p*. 19; non *Hochst. in Richard*.

Flor. Abyssin. Western Texas, San Pedro; *Wright*, No. 1841. On the Cimaron; *Fendler*, No. 794. Eagle Springs; *Bigelow.*

EUPHORBIA ACUTA (nov. spec.): perennis, multicaulis, erecta, foliosa, hirsuta; foliis e basi obtusa subæquali lanceolatis acutatis cartilagineo-mucronatis supra nudis; stipulis filiformibus mox deciduis; anthodiis versus caulis apicem alaribus s. pseudoaxillaribus sparsis; involucris hemisphæricis appendicibus truncatis crenatis lobatisve; stylis patulis ultra medium bilobis, ovario cano longioribus capsula cana; seminibus subcubicis acutis acute angulatis lævibus. Stony prairies western Texas, along the San Pedro and Pecos rivers, &c.; *Bigelow, Schott.* (No. 1739 and 1749, *Wright.*) Stems ½–1 foot high; stiff rigid, leaves 6–10 lines long, 3–6 lines wide, well characterized by the very acute point; seeds 1 line long.

EUPHORBIA ANGUSTA (nov. spec.): perennis, erecta, elatior, rigida; foliis lanceolato-linearibus basi acuta subæqualibus acutis integris demum glabratis; stipulis subulatis minutis deciduis; anthodiis pseudoaxillaribus sparsis; appendicibus truncatis crenatis sæpe bilobis erectis; stylis brevibus erectis apice bilobis; capsula cana acutangula; seminibus ovato-cubicis acutangulis transverse rugosis foveolatis. In rocky places western Texas; *Lindheimer*, No. 694; *Wright*, No. 1828. On the Rio Grande; *Schott.* Erect, 6–15 inches high; several stems form a large black perennial root with few or numerous elongated branches; leaves few, 6–15 lines long, 1–2 lines wide. Seeds 0.8 line long, strongly marked.

EUPHORBIA FLORIDA (nov. spec.): annua, erecta, patulo-ramosa, glaberrima; foliis lanceolato-linearibus seu linearibus in petiolis attenuatis serrulatis mucronatis; stipulis lineari-subulatis sæpe 2–3-fidis; involucris alaribus in cymulas terminales laxas congestis; pedunculis petiolum longe superantibus; lobis involucri ovatis acutis seu acuminatis ciliatis seu rarius laceris; appendicibus magnis (involucro ipso majoribus) orbiculatis seu ovatis petaloideis integris; stylis ovarium æquantibus seu superantibus basi coalitis ad medium seu ultra bifidis; stigmatibus filiformibus; capsula obtuse angulata; seminibus subcubicis acute angulatis lævibus transverse 2-costatis. Sonora; *Wright*, (No. 1829,) *Thurber, Schott.* Stem ½–1 foot high; leaves 12–18 lines long, 1–1½ line broad; margin revolute, and serratures thereby often invisible. Involucre with large bright white appendages, 3 lines in diameter.

EUPHORBIA TRACHYSPERMA (nov. spec.): annua, erecta, glaberrima; foliis e basi subæquali obtusa seu angustata oblongo-lanceolatis serratis mucronatis; stipulis filiformibus seu subulatis setaceo-fissis; anthodiis alaribus demum in cymulas paucifloras terminales s. laterales confertis; appendicibus angustis albis; stylis ultra medium bifidis; capsula obtusangula; seminibus subcubicis faciebus læviusculis, angulis acutis crenatis asperatis. San Pedro; Sonora, *Wright*, No. 1832. Slender, erect, about 1 foot high, branches erect, few; leaves 9–12 lines long, 2–3 lines broad; seed 1 line long.

EUPHORBIA EXSTIPULATA (nov. spec.): annua, erecto-patula, ramosa, glabriuscula seu minute sparsimque aspera; foliis lanceolatis seu lanceolato-linearibus argute serratis basi æquali in petiolem brevem angustatis; stipulis subnullis s. glanduliformibus; anthodiis alaribus solitariis; pedunculis petiolo brevioribus; appendicibus anticis plerumque 2-lobatis, posticis majoribus 4-lobatis; stylis ovarium ad angulos scabrum æquantibus, profunde bipartitis; stigmatibus filiformibus; seminibus magnis subcubicis verrucosis et transverse 2–3-costatis. Western Texas; *Wright,* (1833 and 1838.) New Mexico; *Fendler*, (No. 790.) Sonora; *Thurber, Bigelow, Parry.* Stem about 6 inches high; leaves about 1 inch long, 1–2 rarely 3 lines wide, sometimes not absolutely opposite, but a little separate; seed 1 line long, with thick cross-ribs. A transition form to the next sections.

§ II. ZYGOPHYLLEÆ.

Euphorbia hexagona, *Nutt. in Spreng. Syst.* 3, *p.* 791. E. heterantha, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 173. Rio Coleto, Texas; *Thurber.* "Many years ago Mr. Nuttall gave me specimens of this plant, named E. hexagona. Part of these were sent to Sprengel, who first published a description of the species in the work quoted. Eight years afterwards Mr. N. described the plant under another name. It is remarkable for being polygamous; most of the involucres containing only male flowers."—*Torrey, MSS.*

Euphorbia bilobata (nov. spec.): annua, erecta, gracilis; foliis oppositis breviter petiolatis lanceolato-linearibus acutatis integris glabriusculis, rameis angustioribus; anthodiis alaribus campanulatis; glandulis bilobis, appendiculis binis lanceolatis seu abbreviatis; stylis vix basi connatis ad medium bilobis; stigmatibus erectis subteretibus; capsula læviuscula, seminibus ovatis acutis angulato-tuberculatis. Near the Copper Mines, New Mexico; *Bigelow.* Eastern Sonora; *Wright,* (No. 1831.) Stems 6–15 inches high; leaves 10–15 lines long, 1-2 lines broad; seeds 0.8 line long, strongly tuberculate and almost angular. Glands remarkable and very constant in shape; appendages white. Near E. hexagona; distinguished by the acuter more uniform leaves, bilobed glands, terete stigmata and smaller tuberculate seeds.

Euphorbia bifurcata (nov. spec.): glabra; caule erecto dichotomo; foliis oppositis ovatis seu obovatis in petiolem gracilem subæquilongum angustatis argute serratis obtusis basi glanduloso stipulatis; anthodiis alaribus breviter pedunculatis; lobis 5 ovatis truncatis fimbriato-multifidis; glandula singula cyathiformi late albo-appendiculata, appendice transverso emarginato; stylis basi coalitis ad medium bifidis, stigmatibus filiformibus. Moist places, Valley of the Limpio, July; *Bigelow.* Over a foot high; leaves 1 inch long, ½ inch wide; petiole a little shorter than leaf.

§ III. CYATHOPHORÆ.

Euphorbia dentata, *Michx.; β* rigidia: humilior rigida; foliis parvis coriaceis reticulato-venosis scabris margine revolutis. Head of San Pedro river; *Wright.* (No. 1837.) Near Monterey, Mexico; *Dr. Edwards.* *γ.* cuphosperma: erecta, stricta, dentata seu parce pilosa; foliis lanceolatis seu lineari-lanceolatis elongatis subdentatis; capsulis glabris seu pilosis; seminibus majoribus tuberculato-angulatis. Copper Mines, New Mexico; *Wright,* (No. 1834,) to Sonora; *Schott.* Ojo de Gabilari, Chihuahua; *Thurber.*

Euphorbia heterophylla, *Linn.* (E. cyathophora, *Murr.*) Var. graminifolia: foliis angusto-linearibus. Crevices of rocks and dry beds of rivers. Rio San Pedro, Texas; *Bigelow, Schott, Wright,* (No. 653.) South of El Paso; *Wright,* (No. 1835.)

Euphorbia barbellata, (nov. spec.): annua, erecta, glabriuscula; foliis sparsis linearibus seu lanceolato-linearibus seu ovatis lobatisque breviter petiolatis parce argute dentatis, subtus ad nervum medium parce pilosis, basi pilis longioribus confertis barbatis; foliis floralibus ovatis seu e basi dilatata elongatis, basi roseis; anthodiis glomeratis majusculis; glandula singula sessili lobis inciso-dentatis breviore; stylis brevibus erectis basi vix connatis ad medium bifidis. On the Rio Grande, near Eagle Pass; *Wright.* Rio Frio; *Bigelow.* Near E. heterophylla, but stouter, leaves very sharply serrate, involucre larger, styles shorter. Leaves 2–4 inches long, ½ or ¾ inch–1 or 2 lines wide. Beard of coarse hair at base of leaves very conspicuous.

Euphorbia colorata (nov. spec.): erecta, glaberrima; foliis breviter petiolatis sparsis patu-

lis elongato-linearibus revolutis integris; foliis floralibus basi paullo dilatatis puniceis subinde circinatis; glandulis 1–2 stipitatis cyathiformibus compressis margine revoluto sæpe crenulatis involucri lobos laciniatos coloratos superantibus; stylis brevibus purpureis erectis longe connatis, apice bifidis, stigmatibus acutis demum recurvis. Dry arroyas, Aqua Zarco, Sonora, May; and Santa Cruz, Sept.; *Thurber, & Capt.E. K. Smith.* Specimens incomplete, nearly a foot high. Leaves 3–4 inches long, scarcely more than a line wide; floral leaves shorter and about 2 lines wide, deep crimson. Distinguished from E. heterophylla by the narrow revolute leaves, etc. Margin of involucre and styles also purplish. Capsule glabrous and seeds tuberculate, as in the allied species.

EUPHORBIA RADIANS, *Benth. Pl. Hartweg, p.* 38. Plains between San Bernardino and Santa Cruz, Sonora, April; *Capt. E. K. Smith.* Dry valleys near Buena Vista, Mexico; *Dr. Gregg, Dr. Wislizenus*; Mexico; *Berlandier,* (No. 116 and 1375.) Root tuberous; flowers in early spring, before the leafy shoots put out.

EUPHORBIA ERIANTHA, *Benth. Bot. Sulph. p.* 51. Sonora; *Wright,* (No. 1841?)

§ IV. UMBELLATÆ.

EUPHORBIA WRIGHTII, *Torr. & Gray, Bot. Pope's Rep.* On the San Felipe and the San Pedro, western Texas; *Wright,* (No. 1827.)

EUPHORBIA MULTICAULIS, (nov. spec.): annua seu biennis, multicaulis, humilis, erecta, glabra; foliis lineari-oblanceolatis acutis mucronatis serrulatis basi angustata sessilibus; umbellis trifidis, ramis bifidis, bracteis lanceolatis, superioribus ovato-lanceolatis acutis; involucri glandulis tranverse ovatis; stylis basi liberis ad medium seu ultra bifidis; capsulæ coccis dorso verrucosis; seminibus lenticularibus lævibus fuscis. Sonora; *Thurber.* About a dozen stems form a tapering root, 6 inches high, and with erect branches; leaves 4–6 lines long, 1 line wide. Nearly allied to E. obtusata.

EUPHORBIA DICTYOSPERMA, *Fisch. & Mey. Ind. Sem. Petrop.* 1835. E. Arkansana, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 26. Western Texas; *Wright.* Var. MEXICANA: annua seu plerumque biennis, e basi erecto-ramoso; foliis versus apicem crenato-serratis, lobis involucri subintegris; ovarii coccis dorso solum verrucosis. Valley of the Nagas, Balson de Mapimi, *Dr. Gregg;* western Texas; *Wright,* (No. 1824.) γ LEIOCOCCA: capsulis lævibus seu vix hinc inde verruculosis. Texas; *Drummond;* II. 327. Near the Colorado, of Texas; *Wright.*

EUPHORBIA TETRAPORA (nov. spec.): annua, erecta, glaberrima; foliis cuneatis obtusis seu plerumque retusis emarginatis obcordatisve; umbellis trifidis; bracteis spathulatis seu superioribus orbiculatis basi truncatis; cornubus involucri setaceis glandulam transversam æquantibus; capsula dorso lævi; seminibus facie ventrali 4-punctatis, dorsali læviusculis. Georgia; *Boykin.* Louisiana; *Hale.* Texas; *Lindheimer, Wright.* Near E. Peplus as is the following species, but distinguished by the capsule and the seeds.

EUPHORBIA PEPLIDION (nov. spec.): annua, erecta, glaberrima, e basi ramosissima; foliis confertis e basi angustata lineari-oblanceolatis obtusis; umbellis 3-fidis dichotomis, bracteis lanceolatis acutis; cornubus involucri glandulam ipsam æquantibus linearibus obtusis; capsulæ coccis obtusis non alatis seminibus facie ventrali 2-sulcatis, dorsali punctato-exsculptis. Sandy soils, western Texas; *Wright,* (No. 1823.) A small plant, 3–4 inches high, much branched from the base, of the habit of E. exigua. Seeds very similar to those of E. Peplus, 0.6 line long.

EUPHORBIA PEPLOIDES, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.)* 5, *p.* 172, non *Gouan.* E. longicruris, *Scheele in Linnæa,* 22, *p.* 152. Western Texas; *Wright,* (No. 1822;) *Lindheimer,*

(No. 529 and 698;) *Drummond*, (Coll. II, No. 331.) If E. peploides, *Gouan*, of Southern Europe should prove to be a distinct species, Scheele's name must stand for ours.

EUPHORBIA BRACHYCERA (nov. spec.): annua (?), multicaulis, ramosa, erecta, glaberrima; foliis in petiolum brevissimum angustatis lanceolatis seu lineari-lanceolatis acutis mucronatis; umbella 3-fida seu raro 4–5-fida; ramis pluries bifidis; bracteis inferioribus ovato-lanceolatis superioribus rhombeo-orbiculatis mucronatis; glandulis brevissime obtuseque cornutis; seminibus majusculis ovatis maculis irregularibus sæpe confluentibus leviter impressis. Western New Mexico; *Wright*, (No. 1821.) Many stems a foot high from a stout but apparently annual or biennial root; leaves 6–9 lines long, about 2 lines wide, patulous (not erect as in E. esulæformis) regularly lanceolate; upper part of the stem quite ramose; horns shorter than in any of our species, and sometimes almost rudimentary. Seed 1 line in length, similar to those of E. esulæformis, montana and Roemeriana.

EUPHORBIA MONTANA (nov. spec.): perennis, glaberrima; caulibus pluribus ascendentibus; foliis brevibus lanceolatis ovatis obovatis seu suborbiculatis acutis seu obtusis basi subinde subcordatis subsessilibus coriaceis glaucis; bracteis omnibus orbiculato-triangularibus, rarius subcordatis, superioribus subinde transverse ovato-triangularibus, omnibus cuspidatis; glandulis semilunatis, cornubus triangulatis brevibus; seminibus maculis plus minus impressis obscuris confluentibus undique notatis.

α GRACILIOR: caule tenuiori; foliis minoribus suborbiculatis obovatis seu lanceolatis.

β ROBUSTA: caule robustiore; foliis bracteisque majoribus crassioribus late ovatis seu ovato-cordatis.

The var. *α* in New Mexico; *Fendler*, (No. 786;) *Wright*, (No. 661, 1825.) San Luis Mountains, Sonora; *Capt. E. K. Smith.* Stems 4–8 inches high, leaves 2–3 lines long, in young specimens imbricate and red.

Var. *β*, on the upper Platte; *James, Nuttall, Frémont;* is a much stouter plant. Leaves 5–6 lines long, seeds larger. Dr. Wislizenus collected intermediate specimens near Albuquerque.

EUPHORBIA CRENULATA (nov. spec.): annua, erecta, glaberrima; foliis obovatis acutis in basin attenuatis minute crenulato-serrulatis mucronatis; umbella 5-fida, bracteis inferioribus late ovatis acutis, superioribus transversis, omnibus tenuiter serrulatis mucronatis; involucri glandulis longe tenuiterque cornutis; seminibus ovato-subglobosis cinereo-fuscis, maculis obscurioribus irregulariter confluentibus parum impressis. California; *Hartweg*, (1950.) Near Monterey; *Dr. Parry.* About 1–2 feet high, simple or branching above; leaves about 9 lines long, 5 lines broad, involucells broader and shorter; seed nearly a line long, unusually dark for this section. One of the very few peploid Euphorbiæ with crenate leaves.

EUPHORBIA ESULÆFORMIS, *S. Schauer in Linnæa, 20, p. 729.* Near the Copper Mines, New Mexico; *Wright*, (No. 1820;) *Bigelow.* On the Nueces, western Texas; *Wright.* San Luis Mountains, Sonora; *Capt. E. K. Smith.* This species seems to be scarcely distinguishable from the Mexican E. campestris; *Schlechtendal.* The original specimen of the latter, however, has longer and more slender horns; the seeds are wanting. The original specimen of E. esulæformis has similar but smaller seeds than our plant; the horns are also very short and incurved, the gland itself is truncate and notched. Euphorbia brachycera and E. montana come very near to this species.

Var? SUBDENTATA: foliis oblongo-linearibus brevissime petiolatis, inferioribus integris obtusis, superioribus versus apicem mucronatum dentatis, bracteis ovatis obtusis sæpe grosse dentatis.

San Francisco Spring, Sonora; *Parry.* The seeds were not ripe. This is, perhaps, a distinct species, but it must remain as a variety until more complete specimens are obtained.

Euphorbia Lathyris, *Linn.* is somewhat naturalized around Monterey, California. It was doubtless introduced by the Spaniards. We have it also from Saltillo, Mexico, where it was collected by Gregg.

§ V. SPARSIFLORÆ.

Euphorbia misera, *Benth. Bot. Sulph. p.* 51. Near the sea, San Diego, California; *Parry.* A straggling bush, about 3 feet high, abounding in a milky juice. Nuttall found it at Santa Barbara.

Euphorbia antisyphilitica, *Zucc. Acad. Mon.* 1, *p.* 292. Rocky and gravelly hills along the Rio Grande, from the Presidio del Norte to Laredo; *Bigelow, Schott.* Remarkable for its long terete nearly leafless branches, which resemble an Equisetum or an Ephedra.

Phyllanthus Carolinianus, *Walt. Fl. Car. p.* 228; *Ell. Sp.* 2, *p.* 661. P. obovatus, *Willd. Sp.* 4, *p.* 574. Maschalanthus obovatus, *Nutt. Trans. Amer. Phil. Soc.*, (*n. ser.*) *p.* 175. Southern Texas, common.

Phyllanthus polygonoides, *Nutt. l. c.* P. Roemerianus, *Scheele in Linnæa*, 25, *p.* 583. Dry, sandy, and rocky places along the Rio Grande, from New Mexico to the Gulf, and westward in the Mexican States. (No. 1819, *Wright;* No. 337, Coll. II, *Drummond.*) This is certainly an annual, but late in the season, when the lower part of the stem and the root have become indurated and ligneous, it appears as if suffruticose.

Phyllanthus ericoides (n. sp.): fruticulosus, ramosissimus; foliis oblongo-lanceolatis imbricato-confertis subsessilibus glabris coriaceis mucronatis; floribus dioicis axillaribus solitariis brevi-pedicellatis; calycibus 5-(raro 6-) partitis. High mountains near the Rio Grande, in Chihuahua, October; *Parry.* Plant about a span high. Leaves about 2 lines long and scarcely more than half a line wide, acute, nearly sessile, with a pair of subulate persistent stipules at the base. Male flowers about a line long. Calyx deeply 5-parted; the segments oblong and somewhat obtuse. Petals none. Stamens 3; the filaments united into a column, at the base of which are 5 roundish glands. Female flowers rather larger than the male; the segments oblong, acute. Petals none. Ovary with 5 glands at the base; cells uniovulate. Styles 3, two-cleft; stigmas sub-globose. A well characterized species, remarkable for its very small crowded leaves.

Lepidanthus phyllanthoides, *Nutt. l. c.* Ravines on the San Pedro river, western Texas; *Bigelow, Schott.* (No. 636, *Wright.*) Mr. Nuttall's description of this very distinct genus can hardly be improved.

Croton Berlandieri (n. sp.): suffruticosum; ramulis inferne nudis; foliis ovatis cordatis acuminatis membranaceis utrinque stellato-pubescentibus integerrimis vel obsolete denticulatis basi eglandulosis; floribus monoicis, masculis breviter racemosis 5-petalis 20–30-andris, fœmineis petaliferis; stylis bis bifidis; fructibus tomentosis demum glabratis. Neuvo Leon, December; *Thurber.* (Nos. 708 and 2125, *Berlandier.*) Plant apparently about a foot high. Leaves 1–2 inches long, 1–1½ inch wide; the petiole more than half the length of the lamina. Racemes terminating the branches, pedunculate. Male flowers 10–15, crowded on pedicels about a line long. Petals oblong. Stamens with 5 roundish glands at the base. Female flowers 1–2 at the base of the raceme. Calyx woolly, 5-parted; the segments oblong. Petals 5, very narrow, two-thirds the length of the calyx. Ovary woolly, with 5 glands at the base. Styles deeply twice bifid. We have not been able to find any described species to which we can refer this Croton. It is a genuine species of the genus as characterized by Klotsch.

CROTON SONORÆ (n. sp.): fruticosum; foliis ovatis acutiusculis basi obtusis integris supra glabriusculis infra sparsim stellato-pubescentibus; floribus monoicis, masculis paucis sub-13-andris, petalis 5 calyce æqualibus; fœmineis solitariis vel binis, petalis 5 angustis calyce brevioribus; disco 5-lobo; stylis apice bifidis. Sierra de Nayos, July; *Schott.* A small shrub, much branched; the old branches smooth, younger ones furfuraceous. Leaves about an inch long, green both sides but rather paler underneath. Petals of the male flowers hairy at the base. Stamens with 5 spherical orange glands surrounding the receptacle. Female flowers one or two at the base of the short and few-flowered male raceme. Segments of the calyx rather acute. Petal linear-oblong, two-thirds of the length of the calyx. Disk surrounding the base of the ovary rather fleshy, 5-lobed. Styles rather stout, somewhat dilated and moderately bifid. Young fruit subglobose.

CROTON SUAVEOLENS (n. sp.): fruticosum; foliis ovatis obtusis basi rotundatis integerrimis eglandulosis utrinque densissime lanato-tomentosis; floribus monoicis, fœmineis solitariis vel binis, subsessilibus; stylis profunde bipartitis; stamineis brevi-racemosis 12–14-andris. On the Rio Grande, No. 1804, *Wright.* A shrub with stout terete stellately pubescent branches. Leaves growing mostly towards the extremity of the branches, rather thick, paler underneath. Staminate flowers 6–10 in a short raceme, sessile, subtended by minute pinnatifid bracts. Petals 5, oblong. Stamens commonly 14. Fertile flowers usually in pairs at the base of the staminate flowers. Calyx deeply 5-parted; the segments lanceolate and acute. Disk somewhat 5-lobed, with 5 linear or club-shaped processes (petals?) alternating with the calyx-segments. This species seems to be near C. pellitus, *H. B. K.*

C. SUAVEOLENS, var. OBLONGIFOLIUM: foliis oblongis supra discrete stellato-pubescentibus, subtus dense tomentosis; racemo masculo subelongato multifloro, floribus subsessilibus. Rocky ravines along the Rio Grande, from the Pecos and San Pedro to the Gulf. No. 1802, *Wright*, from the Painted Caves, is probably the same, but the specimens are more herbaceous, and they may be only luxuriant shoots. Leaves 1–2 inches long and $\frac{1}{2}$–$\frac{3}{4}$ inch wide, the upper surface much darker than the lower, rather acute and somewhat mucronate. Flowers monœcious; male raceme an inch or more in length. Fertile flowers 1–2. Styles 2-parted nearly to the base.

CROTON LINDHEIMERIANUM, *Scheele in Linnæa*, 25, *p.* 580. Rocky hills, western Texas; New Mexico, Chihuahua and Nuevo Leon; Buena Vista; *Gregg.* (Nos. 641 and 1805, *Wright.*) Plant upright, 1–2 feet high; the branches herbaceous from a woody base. Leaves whitish tomentose with stellate hairs which are somewhat confluent in the centre. Flower smostly diœcious, rarely monœcious, in short racemes, which are subterminal and axillary. Staminate flowers with lanceolate ciliate petals. Stamens about 12; a 5-lobed disk at the base of the hairy filaments. Fertile flowers on pedicels 2–3 lines long; calyx deeply 5-parted. Petals sometimes wanting but usually present and very unequal, 1–2 of them linear and nearly as long as the calyx, the others much shorter or wanting. Disk conspicuous, 5-lobed; the lobes opposite the segments of the calyx. Styles parted nearly to the base; the divisions filiform. This species is known by the name of Mexican Tea.

CROTON FRUTICULOSUM (*Engelm. MSS.*): caule basi fruticoso; foliis ovatis vel lanceolato-ovatis acuminatis acutisve subcordatis remote minutissime denticulatis eglandulosis supra viridis puberulis subtus dense stellato-pubescentibus; floribus monoicis pedicellatis, masculis racemosis 10–5 andris 5-petalis, fœmineis apetalis; stylis profunde bipartitis, laciniis elongatis filiformibus.

Mountain sides and rocky ravines, western Texas; Chihuahua and Sonora. (Nos 639 and 1803, *Wright;* the latter a diœcious form. Nos. 176, 177, and 297 Coll. 1846; Nos. 134 and 297 Coll. 1847, *Lindheimer.* No. 3212, Berlandier, in part; the specimens with hairy fruit being C. trichocarpa, *Torr.* Leaves 1 to 2½ inches long, and half an inch to an inch wide, pubescence of the under surface often of a yellowish tinge. Inflorescence terminal and axillary in the upper leaves. Staminate flowers 10–20 or more. Petals 5-oblong. Stamens exserted; filaments smooth. Disk 5-lobed, glandular. Fertile flowers usually 2, sessile, apetalous; disk indistinct. Capsule globose-trigastric, covered with a short canescent stellate pubescence.

* * HENDECANDRA.

CROTON MURICATUM, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.)* 5, *p.* 173. Hendecandra Texensis, *Klotsch in Erich. Arch.* 1, *p.* 252. H. multiflora, *Torr. in Frêm.* 1*st Rep. p.* 96. New Mexico, Central and Western Texas, Chihuahua and Sonora. (No. 1799, *Wright;* No. 1548, *Berlandier.*) In Nuttall's plant from Arkansas, and in specimens from the Upper Platte, the leaves are densely clothed with stellate hairs on both surfaces, but usually the hairs are rather scattered on the upper side. The fruit is roughened (often only obscurely) with small protuberances. Styles 2 parted and the divisions twice cleft, so that there are 24 stigmas in all.

CROTON MARITIMUM, *Walt. Fl. Carol. p.* 383; *Ell. Sp.* 2, *p.* 646. Hendecandra maritima, *Klotsch, l. c.* excel. syn. Crotonis monanthogynis. Galveston, Texas; *Schott.* (No. 3213 *Berlandier.*) Flowers apetalous. Stamens 11–16; filaments hairy. Disk irregularly lobed: of the fertile flowers annular and obscurely 5-lobed. Styles thrice cleft.

CROTON ARGYRANTHEMUM, *Michx. Fl.* 2, *p.* 215. Western Texas, on the Lower Rio Grande, rare. (No. 1554 and 2552, *Berlandier.*) Apparently suffruticose. Under surface of the leaves somewhat silvery with stellate scales. Flowers monœcious in short terminal racemes. The staminate on short pedicels. Petals 5, oblong. Stamens 9–11. Disk with 5 glandular lobes. Fertile flowers 4–8 in each raceme, apetalous. Styles twice cleft at the summit; more deeply divided in Berlandier's No. 2552 than in the Texan plant.

CROTON (HENDECANDRA) PROCUMBENS, *Eschsch. in Mem. Acad. Petersb.* 10 (*sub Hendecandra*); *Hook. & Arn. Bot. Beech., p.* 389, *t.* 91. C. gracile, *H. B. K. Nov. Gen. & Sp.* 2, *p.* 69. Astrogyne crotonoides, *Benth. Pl. Hartw., p.* 14. Sandy places in various parts of California; *Parry, Rich, Le Conte, Frémont.* Banks of the Colorado; *Schott.* On the Gila River; *Emory.* Along the Rio Grande, from Frontera downward, in Western Texas, Chihuahua and Nuevo Leon; *Wright, Thurber, Bigelow.* (Nos. 1800 and 1801, *Wright;* No. 3211 *Berlandier,* a broader leaved form with more silvery scales.) Some of the forms much resemble C. argyranthemum. That species differs, however, in being only slightly woody at the base; the racemes are short and the flowers are 5-petalled, whereas C. procumbens is decidedly shrubby, the racemes are elongated and the flowers apetalous. In the latter, also, the styles are deeply twice cleft. A remarkably slender variety of the plant, in which the racemes (or rather the axes, from which the lower flowers have fallen) are from 2 to 6 inches long, was found by Dr. Bigelow in a dry arroyo opposite Presidio del Norte.

* * * PILONOPHYTUM, *Klotsch.* Heptalon, *Raf.*

CROTON CAPITATUM, *Michx. Fl.* 2, *p.* 214, *Gray, Man. ed.* 2, *p.* 391. Pilonophytum capitatum, *Klotsch., l. c.* On the Rio San Antonio, Texas; *Schott.* Rio Pecos; *Thurber,* (No. 640, *Wright,* Nos. 861 and 2281, *Berlandier.* No. 862 seems to be the same plant, with the flowers in an abnormal state.)

* * * * GEISELERIA, *Klotsch.*

CROTON GLANDULOSUM, *Linn.; Michx. Fl.* 2, *p.* 214; *Ell. Sk.* 2, *p.* 648. Geiseleria glandulosa, *Klotsch.* On the Rio Grande, near Eagle Pass; *Schott*, *Bigelow*, (No. 638 *Wright.*) In the staminate flowers the calyx is 4–5-parted, the petals 4–6, and the stamens vary from 4 to 8. The calyx of the fertile flowers is unequally 4–5-parted. A common species in the southern and southwestern States, extending into Mexico and South America.

In the herbarium of Berlandier are the following species of Croton which do not occur in any of the Mexican Boundary collections.

CROTON TRICHOCARPUM (n. sp.): fruticosum; foliis lanceolato-ovatis acuminatis vel acutis denticulatis supra glabriusculis subtus canescente stellato-pubescentibus; floribus dioicis, masculis longe spicatis sub-16-andris, petalis calyce æqualibus; fœmineis brevispicatis, petalis 5 angustis calyce brevioribus; stylis profunde bipartitis; fructibus hirsutissimis. Matamoras and San Fernando, Cohahuila; *Berlandier*, Nos. 1503, 1540, 2244, 3003, 3040, and 3212 (in part.) A shrub apparently about 2 feet high. Leaves 1½ to 2½ inches long and half an inch to more than an inch wide; (in Nos. 1503 and 3003 smaller and not acuminate,) obtuse, or somewhat acute at the base. Male spikes 2 to 3 inches long, the flowers on very short pedicels. Petals spatulate-lanceolate, ciliate with long hairs on the margin. Fertile spikes much shorter than the male; the flowers sessile. Sepals acute. Petals lanceolate linear. Disk a narrow ring. Capsule hispid with long hairs, which fall off more or less when the fruit is ripe.

CROTON PENICILLATUM, *Vent.; H. B. K. Nov. Gen. & Sp.* 2, *p.* 84. Tampico; *Berlandier,* Nos. 752 and 2172. "Plant 3–4 feet high."

CROTON SYRINGÆFOLIUM, *H. B. K. l. c.*, *p.* 67. Nos. 745 and 2165, *Berlandier.* No. 744 seems to be the same, with smoother leaves.

GYNAMBLOSIS MONANTHOGYNA, *Torr. in Marcy's Rep.*, *p.* 295. Croton monanthogynum, *Michx. Fl.* 2, *p.* 215. C. ellipticum, *Nutt. Gen.* 2, *p.* 225, (excl. syn.) Engelmannia Nuttalliana, *Klotsch, l. c.* Argothamnia herbacea, *Spreng. syst.* 3, *p.* 848. Rocky places, Escondido Creek, Western Texas; *Bigelow.* (Nos. 441, 946, 1762, 2376 and 2532, *Berlandier.*) Nos. 649 and 2059, *Berlandier*, are very poor specimens of what may be a variety of this plant; but they differ in being more densely pubescent; the male flowers with 10–12 stamens, and at least some of the female flowers with three styles.

EREMOCARPUS SETIGERUS, *Benth. Bot. Sulph.*, *p.* 53, *t.* 26. On the sea beach near San Diego, California; *Parry*, *Schott.* Near San Felipe; *Emory.* This plant begins to flower and even bear fruit when it has scarcely formed a stem and all its leaves are in roseate clusters, spreading flat on the ground.

APHORA HUMILIS, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 54. Gravelly hills along the Rio Grande from New Mexico downward to the Gulf; March to May; *Bigelow, Schott.* San Antonio, Texas; *Thurber.* (Nos. 643 and 1797, *Wright.*) Petals of the fertile flowers longer than the oblong glands. This and the next species differ from A. mercurialina and A. pilosissima in the fertile flowers bearing true petals besides the glands of the disk; the former alternate with the sepals; the latter opposite to them. The hairs, in all the species are simple, and those of the leaves and branches are fixed by the middle.

APHORA LÆVIS (Gray MSS.): glaberrima; caulibus e basi lignoso ramosissimis; foliis oblongis obtusis basi attenuatis; spicis axillaribus paucifloris folio multum brevioribus; petalis in flore masculo lanceolatis calycem paullo superantibus; in flore fœmineo lanceolatis glandulis linearibus emarginatis sub-duplo longioribus. Western Texas; *Wright*, No. 1798. Plant about a span high. Leaves an inch long, tapering at the base into a short petiole. Spikes on short peduncles 4 to 5-flowered; commonly only the lowest flower pistillate. Very near the last species, but differing in being entirely smooth, and in long narrow emarginate glands of the disk.

APHORA LANCEOLATA, *Engelm. & Gray, l. c.* Serophytum lanceolatum, *Benth. l. c.* Sierra de la Nariz, Sonora; *Schott.* On the Gila; *Thurber.* Near A. humilis.

APHORA SERRATA (n. sp.): annua, humilis, pilosa; caule e basi ramoso; foliis oblongis basi in petiolum brevem attenuatis serratis; racemis androgynis paucifloris; floris masculi petalis calyce longioribus, foeminei petalis glandulis multo longioribus. Sandy plains near Fort Yuma, California; *Schott.* On the Rio Gila; *Parry.* Stems moderately branching, 3–6 inches long. Leaves $\frac{3}{4}$–1 inch long, ovate, or elliptical-oblong, obtuse or acute, denticulate-serrate. Clusters or short racemes axillary, 4–5-flowered; one or two of the flowers fertile, the others staminate. Petals of the staminate flowers rhombic-lanceolate, acuminate. Stamens 10, in 2 series, the filaments united into a slender column, at the base of which are 5 oblong erect glands. Fertile flowers 5-petalled, with 5 linear short glands alternating with the petals. Ovary trigastric, very hispid; styles deeply 2-parted; the divisions linear. Seed the size of a large pin-head, globose-obovate, gray, corrugated.

We have incomplete specimens (with staminate flowers only) of an allied species, or a variety of this plant, collected by Mr. Schott, on the Sierra del Tule, Sonora. It is much larger than A. serrata; the branches are quite smooth, and the oblong remotely denticulate leaves (1–2 inches long) are only sparsely hirsute. The racemes, or spikes, are axillary, 8–10-flowered, on peduncles about as long as the petioles. Segments of the calyx narrowly lanceolate. Petals 5, rhombic-lanceolate, purple. Stamens 10, in two series, one above the other; the filaments united into a column, with 5 oblong glands at the base. Another allied species, or probably variety, was found by Mr. Blodgett, in dry places, at Key West. It seems to be a prostrate annual, slightly hirsute, with ovate-oblong acute sub-sessile leaves, which are either denticulate-serrate, or nearly entire. Clusters 4–5-flowered. Petals of the staminate flowers oblong, a little exceeding the calyx. Fertile flowers 5-petalled, the petals ovate, half the length of the calyx. Glands very short and emarginate. Seed sub-globose, reticulate-corrugate.

APHORA MERCURIALANA, *Nutt. in Amer. Phil. Trans. (n. ser.)* 5, *p.* 174. Serophytum Drummondi, *Benth. Bot. Sulph. p* 53. Western Texas; *Wright.* (No. 2166, *Berlandier.*)—Var. PUMILA: nana, glabrescens, e basi ramosa; floris masculi petalis calyce paulo longioribus. Springs near Eagle Pass, on the Rio Grande; *Bigelow.* The variety is woody at the base, as in the ordinary form. The stem is only 4–6 inches long. Leaves (in dried specimens) more or less tinged or clouded with purple.

APHORA PILOSISSIMA. Serophytum pilosissimum, *Benth. l. c.* Southern Texas. (*Berlandier,* No. 2566.) This is the same as No. 322 of Drummond's third collection of Texan plants. Engelmann and Gray incorrectly refer this species to A. mercurialina, *Nutt.*

MOZINNA SPATHULATA, *Orteg. Dec.* 8, *p.* 105, *t.* 13. Var. SESSILIFLORA, *Hook. Ic.* 4, 357. Gravelly hills and mountain sides, western Texas, Chihuahua, Coahuila, and Nuevo Leon; flowering throughout most of the season. Near Matamoras; *Berlandier,* No. 3210. (No. 1812, *Wright.*) An erect shrubby plant, with nearly simple rather stout branches. Leaves 1–2 inches long, varying from linear to obovate-spatulate, and from obtuse or emarginate to acute. Flowers white, in small facicles, growing, with the leaves, from short wart-like spurs. Fruit ovate, acute, often (by abortion) 1-seeded, the thin papery endocarp separating from the exocarp. Seed the size of a large pea, glabrous. All the species of this genus are called by the Mexicans

Sangre de Drago. Dr. Gregg, who found the present species in Chihuahua and other parts of Mexico, says it is astringent, and is employed by the natives as a remedy for sore gums and loose teeth. Mr. Schott found on the Sierra del Tule and Tinaja Alta, in Sonora, incomplete specimens of a Mozinna, which is probably a variety or state of M. spathulata. The leaves are about one-third of an inch long, obovate-cuneate, obtuse or emarginate, and the inflorescence is more expanded, so as to be somewhat paniculate. The fertile flowers were not collected.

MOZINNA CANESCENS, *Benth. Bot. Sulph. p.* 52, *t.* 25. Near Quitobaquata, Sonora, August; *Schott.* Our specimens are with staminate flowers only. I fear this is not sufficiently distinct from M. cordata, *Ort.*

MOZINNA CARDIOPHYLLA (n. sp.): foliis late cordatis acuminatis petiolatis crenato-dentatis; floribus masculis paniculatis. Near Tucson and Sierra Verde, Sonora, June; *Schott.* Plant glabrous, apparently 1–2 feet high. Leaves about an inch long, broadly cordate, rather coarsely crenate-toothed. Flowers nearly as in the two other species; only the staminate known.

CNIDOSCOLUS STIMULOSUS, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 26. C. Michauxii, *Pohl.* fide *Klotsch.* Jatropha stimulosa, *Michx. Fl.* 2, *p.* 216; *Ell Sk.* 2, *p.* 649. Sandy places along the lower Rio Grande and westward to Sonora. (Nos. 1071 and 2501, *Berlandier.*) Variable in the size and outline of the leaves.

CNIDOSCOLUS ANGUSTIDENS (n. sp.): herbaceus, pilis urentibus hispidus; foliis ad mediam 3–5-lobatis, lobis grosse inciso-dentatis, dentibus angustis elongatis acutisimis macronato-setaceis; floribus cymosis, centrali fœminei; calycis laciniis tubo subæquantibus. Santa Cruz, &c., Sonora; *Thurber, Schott.* (No. 1809, *Wright.*) Plant one to two feet high, more or less hispid with stinging hairs. Leaves remarkable for the long narrow salient teeth, which terminate in a rigid bristle; the lamina sometimes nearly smooth, but the petiole always hispid. Flowers as large as in C. stimulosus, but the tube of the petaloid calyx much shorter. Stamens 10; the filaments monadelphous about half their length, in two series of five each; the interior about one-third longer than exterior. At the base of the column are five small sessile glands.

JATROPHA MULTIFIDA, *Linn. Sp. p.* 1429; *H. B. K. Nov. Gen. & Sp.* 2, *p.* 105. J. macrorhiza, *Benth. Pl. Hartw. p.* 8? Plains along the Rio Grande from the Presidio del Norte downward to Neuvo Leon, and westward to Sonora, May–July. (No. 1808, *Wright.*) Plant about a foot high, herbaceous from a thick root or rhizoma. Leaves 3–5-lobed, the lobes oblong-lanceolate, laciniate and toothed, the teeth very acute and pointed with a bristle. Stipules deeply laciniate with subulate segments. Flowers in terminal cymes, the alar one of the primary usually fertile, the others staminate. Bracts ciliate. STAMINATE FL. Calyx deeply 5-parted; the segments laciniate-toothed. Corolla white, about twice as long as the calyx; segments obovate-spatulate. Stamens 8, monadelphous below, 3 of them longer than the other 5; the column with 5 erect cuneate emarginate glands at the base. FERTILE FL Calyx and corolla nearly as in the staminate, except that the segments of the former are more laciniate. Style 3-parted nearly to the base; the divisions 2-cleft at the summit. Capsule about half an inch in diameter, nearly smooth, (granular when dry.) Seeds oblong, light brown with purple spots. Mr. Thurber informs us that the Mexicans know the seeds of this species to be purgative.

JATROPHA BERLANDIERI (n. sp): glabra; foliis radicalibus longissime petiolatis glaucis palmatim 5–7-partitis, segmentis oblongis vel obovatis laciniato-dentatis vel pinnatifido-incisis; calycis segmentis ovatis integris corolla multo brevioribus; floribus masculis 8-andris. On the Lower Rio Grande; *Wright,* No. 651. Plains near Eagle Pass and Piedra Pinta; *Bigelow, Schott.* Monterey, Neuvo Leon; *Dr. Edwards.* (No. 1810, *Wright.* No. 2060 and 3124, *Berlandier.*) Stem about a foot high, from a large oblong-conical starchy root. Leaves divided nearly to the base, the laciniæ often linear and very narrow; petioles 2–6 inches long. Flowers in terminal cymes, the alar one only fertile. Corolla purple; the segments obovate-oblong. Stamens monadelphous only near the base, 5 of them a little shorter than the other three; anthers linear, elongated: 5 glands at the base of the column. Styles short, united below; stigmas somewhat thickened, 2-lobed.

JANIPHA LOEFLINGII, *H. B. K. Nov. Gen. & Sp.* 1, *p.* 107. Jatropha Janipha, *Linn.* Ringgold Barracks, lower Rio Grande, June; *Schott.* Stems slender, glabrous. Leaves deeply 3–5-lobed, the lowest lobes smallest and entire, the others (especially the middle one) more or less panduriform. Staminate flowers 8–15 in a terminal raceme; the pedicels scarcely one line long; calyx tubular and at length salverform; the segments linear-oblong. Stamens 8; filaments free to the base; 5 of them shorter than the other; 5 small glands at the base of the filaments. Fertile flowers 2, at the base of the staminate raceme, their pedicels at length 6–8 lines long and reflexed. Calyx 5-parted to the base. Ovary globose, smooth, sometimes with 1 or 2 filaments bearing 1-celled anthers. Styles 3 short; stigmas dilated, cristate-lobed. Ripe fruit not seen. This is intermediate between J. Loeflingii and J. Yuquilla, and all are probably forms of one species.

JANIPHA MANIHOT, *H. B. K. l. c.*: var. ANGUSTILOBA: foliis 5-partitis, laciniis anguste lanceolato-linearibus integerrimis vel undulatis acutis. Santa Cruz and Tubac, Sonora, June—July; *Schott.* Near Monterey, Neuvo Leon; *Gregg.* No. 1811, *Wright.* Plant smooth, 1–2 feet from a somewhat shrubby base, branching above. Leaves mostly 5–parted; the segments 2–5 inches long and 1½–5 lines wide, usually somewhat undulate and sometimes approaching to panduriform. Stipules minute and subulate. Racemes 15–20-flowered; the 2 lowest flowers fertile, the others staminate. Calyx of the staminate flowers greenish-white, broadly campanulate, 5-lobed about half way down; the lobes oblong. Stamens 10; filaments distinct, 5 of them longer than the others; 5 glands at the base of the column. Calyx of the fertile flower 5-parted to the base. Pistil nearly as in J. Loeflingii. Fruit 3-lobed, the carpels 1-seeded. Seeds 4½ lines long, gray, mottled with dark purple. This differs from any form of J. Manihot in our herbarium, but it seems hardly a distinct species.

ACALYPHA CAROLINIANA, *Walt. Fl. Car. p.* 238; *Ell. Sk.* 2, *p.* 645. Ravines near Presidio del Norte, and near the Copper Mines, August—September; *Bigelow.* Annual. Staminate spikes axillary, 3–4 lines long; fertile ones terminal 2–3 inches long. Involucre cut into deep narrow segments. Capsule echinate with short soft spines. Very near A. polystachya of the West Indies.

ACALYPHA VIRGINICA, *L. Sp. p.* 1423; *Torr. Fl. New York*, 2, *p.* 173. Near the Copper Mines, New Mexico; *Bigelow.* No. 1817 and 1818, *Wright.* Differs somewhat from the eastern plant in the longer spikes and the more foliaceous terminal bracts.

ACALYPHA GRACILENS, *Gray, Man. Bot. ed.* 2, *p.* 390. Western Texas, *Wright.* More common southward and westward than the last.

ACALYPHA PHLEOIDES (*Cav.?*): suffruticosa; foliis ovatis subsessilibus serratis; spicis terminalibus solitariis androgyonis superne masculis inferne fœmineis; involucris 5-dentatis. A. phleoides, "*Cav. Ic.* 6, *p.* 48, *t.* 569, *f.* 2;" *ex Pers. Syn.* 2, *p.* 581. Hill sides, western Texas, Chihuahua, Cohahuila, Sonora, &c., April—July. No. 1815 and 1816, *Wright.* Stem apparently prostrate with erect hairy branches about a foot high. Leaves an inch long, rather acute at both ends, a little hairy above and underneath. Stipules subulate, very small. Spikes terminating the branches, 1–2 inches long, the summit usually staminate and much more slender than the fertile portion. Bracts of the fertile flowers coarsely and acutely 5-toothed, sparingly ciliate with rigid hairs. Capsule hispid at the summit. According to Dr. Gregg this plant is used by the Mexicans as a wash for sore gums and loose teeth, and as an application to ulcers. It is doubtful whether this is A. phleoides, as that species is said to be an annual. Our plant seems to be nearly allied to A. prunifolia, but that also is described as an annual.

ACALYPHA HEDERACEA (n. sp.): e caudice lignoso multicaulis, molliter incano-pubescens seu villosa; foliis orbiculari-reniformibus longe petiolatis crenato-dentatis; spicis dioicis (rarissime monoicis) terminalibus pedunculatis, stamineis gracilibus fœmineis brevibus crassis, bracteis obtuse 9–10-dentatis. Damp places, valley of the Pecos; *Bigelow.* Neuvo Leone and Chihuahua, *Gregg, Edwards.* May—September. (No. 648, 1813 and 1814, *Wright.* No 473, *Lindheimer.*) Plant slender, prostrate, branches 6–15 inches long. Leaves 6–10 lines in diameter, mostly broader than long, truncate or cordate at the base. Staminate spikes 6–10 inches long; the peduncle often 1–2 inches long. Fertile spikes half an inch long. Bracts cucullate. Fruit hispid.—In one of Mr. Wright's specimens (No. 1813) there are sessile axillary few-flowered fertile spikes, and others that are androgynous, consisting of a short pedunculate staminate spike with a single fertile flower at the base.

ACALYPHA RADIANS (n. sp.): e basi suffruticosa multicaulis, pilis longis patentissimis villosa; foliis longe petiolatis orbiculari-reniformibus inciso 7–13-fidis, lobis sublinearibus; spicis dioicis terminalibus pedunculatis, stamineis oblongo-linearibus, fœmineis crassis; bracteis obtuse 9–10-dentatis. Western Texas, especially along the lower Rio Grande, and in the adjoining Mexican States. (No. 251, Coll. II,) Texas, *Drummond.* No. 649, *Wright.* No. 636, 1070, 2046, and 2500, *Berlandier*) This is certainly very near the last, but I have not seen intermediate forms. It it is easily distinguished by its hairiness, and the radiately lobed leaves.

TRAGIA URTICÆFOLIA, *Michx. Fl.* 2, *p.* 176; *Ell. Sk.* 2, *p.* 564. T. betonicæfolia, *Nutt. l. c. p.* 173. T. brevispica, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 54; *Scheele in Linnæa,* 25, *p.* 486. Rocky ravines and hill sides, New Mexico, and western Texas, along the Rio Grande to the Gulf. (No. 307, Coll. II. Texas, *Lindh.* No. 260, Coll. III. Texas, *Drummond.* No. 1793, *Wright.*) No. 647 of Wright's earlier collection in the same plant with the flowers and fruit in an abnormal state. I can find no sufficient characters for distinguishing this plant from T. urticæfolia, *Mx.* The stems are at first upright, but at length prostrate or sometimes even a little twining. The length of the spikes is very variable. In specimens from Arkansas the fertile flowers have the calyx 6-petalled, and the staminate 4–5-sepalled, 4–5-androus. The stems are somewhat woody at the base.

TRAGIA URTICÆFOLIA, var.? LACINIATA: foliis pedatim 3-partitis, laciniis pinnatifidis, intermedio longiore. Sonora, Mexico, *Thurber.* No. 1795, *Wright.* Stem apparently prostrate, 12–15 inches long, paniculately branched, hirsute. Leaves 1–1¼ inch long, the lower ones on short petioles, upper nearly sessile, pedately divided to the base, pinnatifidly cut into acute segments or teeth; the lateral lobes sometimes unequally 2-cleft. Racemes terminating the short branches, few-flowered, the lowest flower fertile. Calyx and fruit as in the ordinary form, *Fruit.* A remarkable variety, approaching (by the description) T. cannabina. Mr. Schott collected in the northwestern part of Sonora specimens of a Tragia that seems intermediate between T. urticæfolia and this plant. The leaves are oblong-ovate and coarsely toothed, and part of them are 2-lobed at the base or somewhat halberd-form, showing the tendency to become pedate.

TRAGIA RAMOSA, *Torr. in Ann. Lyc. New York,* 2, *p.* 245. T. angustifolia, *Nutt. l. c.* T.

scutellariæfolia, *Scheele, l. c.* Gravelly hills of the Limpio; *Bigelow.* Ravines of the Organ mountains, April; *Parry.* On the upper Rio Grande, New Mexico; *Fendler*, No. 776. Perhaps only a var. of the last. It differs chiefly in being much smaller and erect, with the leaves scarcely at all cordate. Var.? LEPTOPHYLLA: foliis linearibus integris vel remote denticulatis.—Near Howard's Springs; *Bigelow;* No. 1796, *Wright.* Plant woody at the base, about a span high, and branched from the base. Stem and branches sparingly hirsute. Leaves 1–1¼ inch long and 1–2 lines wide. Spikes few-flowered; the lowest flowers fertile. Flowers as in T. ramosa, etc.

TRAGIA URENS, *Linn. Sp. p.* 1391; *Ell. Sk.* 2, *p.* 564. Hills on the lower Rio Grande; *Schott.*

TYRIA MYRICÆFOLIA, *Scheele in Linnæa*, 25, *p.* 581. Rocky hill sides near the Pecos and Live Oak creek, also on the Flounce mountains, etc.; western Texas and Chihuahua; *Bigelow, Schott.* San Felipe, California; *Parry.* No. 1806 and 1807, *Wright.* An irregularly branched homely shrub, 3–10 feet high, of a grayish green color, clothed with a minute stellate pubescence. Sterile flowers on short pedicels which are aggregated upon spurs or short branches and articulated at the base. Sepals mostly 3, sometimes 4. Stamens 3–20, the filaments distinct, with minute alternate capitate pedicellate glands at their base. No abortive ovary. Fertile flowers sessile. Fruit tricoccous or by abortion dicoccous.

SAPIUM? ANNUUM (n. sp.): annuum, humile; foliis rhombeo-oblongis acuminatis basi attenuatis prominenter trinervibus spinuloso-dentatis rigidulis eglandulosis. Stillingia spinulosa, *Torr. in Emory's Rep. p.* 151. In the sandy desert west of the Colorado, California; *Major Emory.* Near Fort Yuma; *Schott.* Var. DENTATUM: foliis oblongis vel obovato-oblongis obtusis vel acutiusculis membranaceis acute dentatis, dentibus inermibus, venis inconspicuis. Wet ravines, Eagle Pass, Lower Rio Grande; *Bigelow, Schott.* Valley of the Almo; *Parry.* Near Monterey, Neuvo Leon; *Dr. Edwards & Major Eaton.* These two forms differ considerably, but they probably belong to one species. They are both undoubtedly annual.

SAPIUM SYLVATICUM. Stillingia sylvatica, *Linn. Mant. p.* 126; *Ell. Sk.* 2, *p.* 560. Var. LINEARIFOLIA: foliis anguste-linearibus argute serrulatis, serraturis glandulosis. Ravines on the San Pedro river and on limestone rocks higher up on the Rio Grande; *Schott, Bigelow.* Leaves 2½–3 inches long, 2–3-lines wide, somewhat coriaceous. Spikes androgynous, 1–2 inches long, 2–4 of the lowest flowers fertile. Staminate flowers 5–10 on short pedicels under each scale or involucre. Calyx hemispherical, 2-lipped; the border slightly crenulate. Stamens 2: filaments united at the very base.

SAPIUM SALICIFOLIUM, *H. B. K. Nov. Gen. & Sp.* 2, *p.* 65. Between Rayon and Ures, Sonora; *Thurber.* "A shrub 10–12 feet high with somewhat erect and slender branches, and deep green foliage." Leaves 1½–2 inches long, and 3–4 lines wide, somewhat coriaceous, rather acute, remotely denticulate, the upper side (when dry) of a verdigris green color, often with 2 minute glands at the base. The specimens are in fruit. The capsule is solitary and apparently axillary, on a short peduncle, smaller than in S. sylvatica, but in other respects similar, and without any remains of the staminate spike. On the Sierra de la Nayoz, in Sonora, Mr. Schott gathered specimens of what seem to be the same plant. The leaves are similar in form, but a little wider, more membranaceous and rather obtuse, or sometimes even emarginate. The staminate spikes are without any fertile flowers at the base. There are 10–20 sessile flowers under each scale or involucre. The calyx is manifestly 2-lipped, and the stamens seem to be constantly two, the filaments of which are scarcely united at the base. Fertile flowers not seen. Fruit solitary and resembling that of S. salicifolium, except in being larger. The plant seems to be dioecious.

The genera Sapium and Stillingia are, we think, very properly united by Klotsch. Long ago Ad. Jussieu remarked (*Euphorb. p.* 50) that they were scarcely distinct and ought perhaps to form one genus. The calyx of the staminate flowers is the same in both, although it is described as tubular in the latter. The number of staminate flowers under a single bract or involucre is not a sufficient distinction. There are several in S. sylvaticum and S. salicifolium; but in S. annuum and S. ligustrinum they are solitary.

Simmondsia Californica, *Nutt. in Hook. Lond. Jour. Bot.* 3, *p.* 400, *t.* 16; (Tab. XLIX.) Dry hills along the Gila and westward to San Diego; not uncommon in various parts of southern California. Nuttall did not see the fruit. This is about three-fourths of an inch long, ovate and obtusely triangular, abruptly pointed, and somewhat resembles the gland of an acorn. At maturity it splits into 3 valves; the dehiscence being loculicidal. It usually contains but a single seed, which is conformed to the cavity of the pericarp. The embryo is wholly destitute of albumen. The cotyledons are very thick and fleshy, and they cohere together, so that they only separate after considerable boiling. The radicle is minute and superior. The nuts have somewhat the flavor of filberts, but the after-taste is rather nauseous, and they are apt to cause purging. Mr. Nuttall thinks this genus is very clearly allied to Garrya, but it differs in several important characters. Lindley places it, without a remark, in Euphorbiaceæ, and we are inclined to follow him, notwithstanding the absence of albumen.

Suborder BATIDEÆ.

Batis maritima, *Linn.; Torr. in Smithson. Contrib.* 6, *p. t.* 11. On the beach, at Brazos Santiago; *Schott.*

Batis Californica, *Torr. l. c.* Salt marshes near San Diego, California; *Parry.* We have received no more specimens of this plant since it was first described, and are by no means certain that it is specifically distinct from B. maritima.

URTICACEÆ.

Urtica urens, *Linn. Spec.* 2, *p.* 284; *Miquel in Mart. Fl. Bras. fasc.* 12, *p.* 195, *t.* 67. In the streets of Monterey, California, where it has manifestly been introduced, May; *Parry.* Wet ravines near the Organ mountains, New Mexico; *Bigelow.*

Urtica purpurascens, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 169; *Gray, Man. ed.* 2, *p.* 398. San Antonio, Texas; *Thurber.* Near Eagle Pass on the Rio Grande; *Bigelow.* It is commonly simple, but Dr. Bigelow's specimens are branching from the base.

Urtica gracilis, *Ait. Hort. Kew* 3, *p.* 341; *Gray, l. c.* Banks of the Limpio, July; *Bigelow.* California; *Rev. A. Fitch.* Stem 4–5 feet high. Leaves often ovate and sometimes slightly cordate, coarsely toothed.

Boehmeria cylindrica, *Willd. Sp.* 4, *p.* 340. Banks of streams and wet thickets, western Texas.

Parietaria debilis, *Forst.* S. Floridana, *Weddell, Monogr. Urtic. p.* 316. P. Floridana, *Nutt. Gen.* 2, *p.* 208; *Ell. Sk.* 1, *p.* 576. Rocky places along the upper Rio Grande and in Sonora, March—May. (No. 1861, *Wright.*) The leaves vary from nearly orbicular to ovate-oblong. The narrower leaved forms approach P. Pennsylvanica. Found in many parts of the world, but not in Europe.

HUMULUS LUPULUS, *Linn. Sp.* 2, *p.* 1028; *Torr. Fl. N. York,* 2, *p.* 225, *& in Sitgr. Rep. p.* 173 H. Americanus, *Nutt. Pl. Gamb. in Jour. Acad. Phil. n. ser.* 1, *p* 181. Banks of the Mimbres; *Bigelow.* (No. 1860, *Wright*)

MORUS RUBRA, *Linn l. c. p.* 986; *Michx. f. Sylv.* 2, *t.* 116. Common in western Texas, New Mexico, and Chihuahua; often flowering and bearing fruit when a low shrub. (No. 1859, *Wright.*) Nos. 2498 and 2416, *Berlandier.* The leaves are commonly about two inches long, but those of vigorous shoots are sometimes 11 inches long and 8 inches in diameter.

CELTIS OCCIDENTALIS, *Linn. Sp. (ed.* 2) 2, *p.* 1478; *Michx. f. Sylv.* 2, *t.* 114; *Torr. Fl. N. York,* 2, *p.* 167. C. crassifolia, *Lam.* Western Texas and New Mexico. We quite agree with Dr. Gray in regarding C. crassifolia as a mere variety of this species. Some of our specimens show a transition to C. Mississippiensis, *Bosc,* (C. integrifolia, *Nutt* ,) which Dr. Gray suspected was not distinct.

CELTIS (MOMISIA) PALLIDA (n. sp.): ramis incano-puberulis; spinis subgeminis rectis; foliis ovatis vel ovato-oblongis pauci serratis integerrimisque puberulis crassiusculis breviter petiolatis basi acutiusculis raro leviter cordatis; cymulis polygamis 3–5-floris petiolo paullo longioribus; bacca ovata laevi glabra. (TAB. L.) Common in western Texas and along the Rio Grande, from Fort Duncan to the Gulf, and west to Magdalena in Sonora. It is called Grangeno in Neuvo Leon. (No. 1858, *Wright;* No. 3021, *Berlandier.*) A shrub 6–10 feet high, with numerous flexuous spreading branches. Thorns from 2 or 3 lines to an inch in length. Leaves 8–14 lines long, mostly acute, 3-nerved, minutely pubescent and somewhat scabrous on both sides. Flowers small, white; the lower ones of the cymule mostly male, with a rudimentary pistil; the terminal one perfect. Styles thick, divaricate, cleft nearly half their length, the undivided portion rather shorter than the ovary. Berry about three lines long, orange, yellow, and red, with an acid pulp, which is edible but rather astringent. This species seems to be nearest the Brazilian C. orthocanthos, *Planch.*

ULMUS CRASSIFOLIA, *Nutt. in Trans. Amer. Phil. Soc. (n. ser.)* 5, *p.* 169. U. opaca, *Nutt. Sylv.* 1, *p.* 35, *t.* 11. On the banks of rivers, from San Antonio, Texas, to the Pecos river; *Schott. Thurber.* (No. 1857, *Wright;* No. 346, Coll. II, Texas, *Drummond;* No. 2546, *Berlandier.*) Mr. Nuttall, in his Sylva, has overlooked his much earlier name and description of this species.

ULMUS ALATA, *Michx. Fl.* 1, *p.* 173; *Michx. f. Sylv.* 2, *t.* 127. Near Eagle Pass on the Rio Grande; *Bigelow.*

SAURACEÆ.

ANEMOPSIS CALIFORNICA, *Nutt. in Tayl. Ann. Nat. Hist.* 1, *p.* 136; *Hook. & Arn. Bot. Beechey, p.* 390, *t.* 92. Wet places, San Luis Rey, California; *Parry.* Western Texas, Mew Mexico, and Chihuahua, April—July.

CERATOPHYLLACEÆ.

CERATOPHYLLUM DEMERSUM, *Linn. Sp. p.* 1409. In running water, near the southern boundary line of Upper California; *Parry.*

BETULACEÆ.

ALNUS VIRIDIS, *DC.* Near San Diego, California; *Parry.* Our specimens are without fruit. Dr. Parry informs me that this is a common species in California, and that it sometimes becomes a tree 40 feet in height, with a trunk 8 inches in diameter. We have specimens of another Alnus, collected in California by *Rev. A. Fitch*, which seems to be A. rhombifolia, *Nutt.* It differs from A. serrulata in the coarse teeth of the leaves, and from all other North American species in the long acute base of the leaves.

ALNUS OBLONGIFOLIUS (n. sp.): ramis glabris nitidis; foliis oblongo-lanceolatis utrinque acutis subduplicato-serratis supra glaberrimis subtus minutissime pubescentibus utrinque viridibus; nuculis apteris. Banks of the Mimbres and near Santa Barbara, New Mexico. (No. 1864, *Wright.*) A tree 30 feet high. Leaves 2½–3½ inches long and 1–1½ inch wide; unequally serrate, serratures glandular at the tip; petiole about one-third as long as the lamina. Catkins somewhat paniculate, ovate. Nutlets orbicular-obovate, without any trace of a wing.

SALICACEÆ.

SALIX LUCIDA, *Muhl.* Var. ANGUSTIFOLIA, *Anders. Salices Bor.-Amer. in Proceed. Amer. Acad.* 4. S. lasiandra, *Benth. Pl. Hartw. p.* 335; *Torr. Bot. Whippl. Rep. p.* 138. Mountains of California, (the precise station not recorded;) *Parry.* "A straggling shrub."

SALIX WRIGHTII, *Anders. l. c.* Borders of the Upper Rio Grande, in western Texas and Chihuahua; also near Lake Santa Maria. (No. 1877, *Wright.*) A tree 15 to 25 feet high.

SALIX LONGIFOLIA, *Muhl.; Anders. l. c.* Between the Pecos and the Rio Grande, and westward to the lower Rio Gila.

I have not ventured to name five or six other willows of the Mexican Boundary collections. Mr. Anderson is preparing a more complete account of this exceedingly difficult genus. He has shown that many of our Salices, until recently supposed to be different from any in the Old World, are identical with European species, or only varieties of them. He desires contributions of specimens from our botanists, that he may be able to perfect his contemplated work.

POPULUS TRICHOCARPA, *Torr. in Hook. Ic.* 9, *t.* 878. Borders of Santa Clara river, near Buenaventura; *Parry.* A tree 30 feet high, with smooth bark. This species is easily distinguished by the hairy fruit.

POPULUS MONILIFERA, *Ait.; Michx. f. Sylv.* 1, *p.* 116, *t.* 96, *f.* 2. Borders of streams from western Texas and New Mexico to California. This is the ordinary cotton-wood of the West.

POPULUS TREMULOIDES, *Michx. Fl.* 2, *p.* 143; *Michx. f. Sylv.* 1, *p.* 125, *t.* 99, *f. c.* Hills near the Copper Mines, in fruit, June; *Bigelow.* (No. 1870, *Wright.*)

POPULUS BALSAMIFERA, *L.; Michx. f. Sylv.* 2, *p.* 121, *t.* 98, *f.* 1. Banks of the Mimbres; *Bigelow.*

POPULUS ANGUSTIFOLIA, *James; Torr. Ann. Lyc. N. York*, 2, *p.* 249; *Nutt. Sylv.* 1, *p.* 52, *t.* 16. Near the Copper Mines of New Mexico and on the banks of the Mimbres; *Bigelow.* This is the Narrow-leaved Poplar of Lewis and Clark's Travels. It is No. 817 of Fendler's N. Mexican Collection.

PLATANACEÆ.

PLATANUS RACEMOSA, *Nutt. in Audubon's Birds*, 1, *t.* 362, & *Sylv.* 1, *p.* 47, *t.* 15; *Newberry Bot. Williamson & Abbott's Rep. p.* 33, *f.* 10. P. Mexicana, *Moric.* P. Californica, *Benth.* Borders of streams near San Diego, etc., California; *Parry.* Guadalupe Cañon, Sonora; *Thurber.* A large tree, sometimes 50–60 feet high. Hartweg states that in California he has seen it 80 feet high and 12 feet in circumference.

Platanus occidentalis, *L. Sp.* 2, *p.* 999; *Michx. f. Sylv.* 1, *t.* 63. Devil's River valley, western Texas; probably the western limit of this species; *Bigelow.*

GARRYACEÆ.

Garrya elliptica, *Lindl. Bot. Reg. t.* 1686. Sandy places near Monterey, California; *Parry.* A shrub, seldom more than 5 or 8 feet high. Both sexes occur in Dr. Parry's specimens.

Garrya Wrightii, *Torr. Bot. Whipp. Rep. p.* 136. Hills near the Copper Mines, New Mexico, abundant; July.

Garrya Lindheimeri, *Torr. l. c.* Western Texas and New Mexico; *Wright.* El Paso; *Thurber.*

JUGLANDACEÆ.

Juglans rupestris, *Engelm.; Torr. Bot. Sitgr. Rep. p.* 171, *t.* 15. J. pyriformis, *Liebm. Vidensk. Meddel. Kjobenh. for* 1850, *p.* 80? Common on the gravelly borders of streams in western Texas from Devil's river to the Pecos and Limpio; also at the Copper Mines. (No. 1029 and 2459, *Berlandier.*) The *var.* major, *Torr. l. c. t.* 16, seems to pass gradually into the small-fruited form. They are found together, and the variety occurs also in Sonora. At San Fernando, beyond Los Angeles, Dr. Parry found a Juglans in flower, which is probably a variety of J. rupestris. The leaflets are 11–13, ovate-oblong, rather obtuse and sharply serrate. He did not obtain the fruit.

Carya olivæformis, *Nutt. Gen.* 2, *p.* 221. Juglans olivæformis, *Michx. Fl.* 2, *p.* 192; *Michx. f. Sylv.* 1, *t.* 32. Western Texas, near the Rio Grande; *Bigelow.* The leaflets are only 9–11, and the nuts much shorter than in the ordinary Pecan.

CUPULIFERÆ.

Castanea chrysophylla, *Dougl. in Hook. Fl. Bor.-Amer.* 2, *p.* 159; *Hook. Lond. Jour. Bot.* 1843, *t.* 16. Near Monterey, California, where it is a bush, only 2–3 feet high. At Santa Cruz, in the same State, it becomes a tree, 50 feet high. The nuts are small, like those of the beech, but rounded on the angles.

Quercus Gambelii, *Nutt. Pl. Gamb. l. c. p.* 179; *Torr. Bot. Sitgr. Rep. p.* 172; *Liebm. Querc. Neo.-Mex. & Calif. p.* 169.* Mountains near the Copper Mines, New Mexico; *Bigelow.* Liebmann refers to this species, No. 806, 809 and 810 b. of Fendler's New Mexican Collection.

Quercus lobata, *Née in Anal. de Cien. Nat.* 3, *p.* 270, (fide *Liebm. l. c. p.* 172.) Q. Hindsii, *Benth. Bot. Sulph. p.* 55; *Torr. Bot. Whipp. Rep. p.* 138; *Newberry in Pacif. R. R. Rep. Bot. p.* 27, *fig.* 5. Near Monterey and in other parts of California. A fine tree, allied to the white oak of the Atlantic States, remarkable for its usually long acorns. Q. lobata is only a form with shorter acorns.

Quercus tinctoria, var.? Californica, *Torr. Bot. Whippl. Rep. p.* 138. Q. rubra, *Liebm. in Benth. Pl. Hartw. p.* 337, non *Linn.* Q. Kelloggii, *Newberry, l. c. p.* 28, *f.* 6. On mountains east of San Luis Rey and San Diego, California; *Parry.* A middle-sized tree. It is called black oak in California. The leaves when young are very downy underneath, and somewhat so on the upper surface; but they are nearly glabrous late in the season. Sometimes the acorn is short and half immersed in the cup.

---

*Published in "Oversigt det Kgl. danske Videnskabernes Selskabs Forhandlinger og dets Medlemmers, i Aaret 1854. Kjöbenhavn"

QUERCUS COCCINEA, var.? MICROCARPA: foliis oblongis profunde sinuato-pinnatifidis utrinque glabris nitidisve, sinubus obtusis, lobis (utrinque 2–3) parce dentatis, dentibus setaceo-acuminatis; fructibus solitariis geminisque, glande oblongo-ovata apiculata. Rocky ravines near the mouth of the Pecos, and on the Limpio: *Bigelow.* Oak Creek, Texas; *Schott.* Differs from the common state of Q. coccinea in the considerably smaller and less lobed leaves, in the acorns being scarcely one-third as large, the cup not turbinate, and the gland longer in proportion to its breadth.

QUERCUS NIGRA, *Linn.; Michx. f. Sylv.* 1, *t.* 20; *Torr. Fl. N. York,* 2, *p.* 188, *t.* 105. Medina Creek, above San Antonio, Texas; *Parry.* This appears to be the western limit of the *Black-Jack Oak.*

QUERCUS OBTUSIFOLIA, var.? BREVILOBA: foliis subcoriaceis obovato-oblongis basi cuneatis, lobis brevibus obtusis supra viridibus subtus pallidis pubescentibus; fructibus sessilibus solitariis vel geminis, cupula depressa hemispherica, glande oblongo-ovato obtusa.—Mountain gorges near Howard's Springs, western Texas; *Bigelow.* We refer this oak to Q. obtusifolia with much doubt, but it seems more nearly allied to that species than to any other. It differs, however, in its leaves being much smaller and far less lobed, more coriaceous and apparently evergreen. The acorns, too, are smaller and the cup more shallow.

QUERCUS UNDULATA, *Torr. in Ann. Lyc. N. York,* 2, *p.* 248, *t.* 4; *& in Marcy's Rep. p.* 297. Q. Fendleri, *Liebm. l. c. p.* 170.—New Mexico, near the Rio Grande. (No. 805 and 807, Fendl. N. Mex. Coll.)

QUERCUS VIRENS, *Ait.; Michx. f. Sylv.* 1, *p.* 57, *t.* 12. Moist woods on the Gulf coast from the Brazos to the Rio Grande, also along the latter river as high as the Pecos and Live Oak Creek. At a distance from the coast it is commonly a shrub 4–6 feet high. The leaves vary from narrowly oblong to broadly ovate. On old trees they are mostly entire, but on young shoots they are often sharply toothed.

QUERCUS EMORYI, *Torr. in Emory's Rep. p.* 152, *t.* 9. Q. pungens, & Q. hastata, *Liebm. l. c. p.* 171. Near the mouth of the Pecos and on the Limpio, Texas; *Bigelow, Parry.* Chihuahua; *Thurber.* Sonora; *Schott & Capt. E. K. Smith.*—A widely spread shrubby evergreen oak, with neat foliage and very small acorns. The small-leaved oak of Frémont, quoted by Liebmann under his Q. chrysolepis, seems to be a variety of this species. No. 664, *Wright,* belongs to the form called Q. pungens by Liebmann, in which the leaves are more deeply toothed or lobed than in the normal state.

QUERCUS AGRIFOLIA, *Née in Ann. de Cienc. Nat.* 3, *p.* 281, fide *Liebm.; Hook. Ic.* 3, *t.* 377. Q. oxyadenia, *Torr. in Sitgr. Rep. t.* 17, *& Bot. Whippl. Rep. p.* 138. Common on the mountains of California, from the Upper Sacramento to the southern boundary line; *Parry.* East of San Diego Dr. Parry saw trees of this oak which were 30 or 40 feet high. When growing singly, it has a round top like the Live Oak, throwing out branches a few feet from the ground and extending 30 feet or more from the trunk.

QUERCUS OBLONGIFOLIA, *Torr. in Sitgr. Rep. p.* 173, *t.* 19. Q. grisea, *Liebm. l. c. p.* 171. Mountains of the Limpio, Texas (*Bigelow*), and westward to the range east of San Diego, California; *Parry.* In Texas and western New Mexico this oak is commonly a shrub 6–15 feet high; but in California it sometimes attains the height of 20 or 30 feet. It has pale bark and spreading branches. The acorns vary considerably in form. To this species I refer No. 665 and 1866, *Wright.*

QUERCUS CHRYSOLEPIS, *Liebm. l. c. p.* 173*; Benth. Pl. Hartw. p.* 336. Q. crassipocula, *Torr. in Pacif. R. Road Expl.* 6, *p.* 365, *t.* 9. Q. fulvescens, *Kellogg in Proceed. Calif. Acad. Nat. Sc.* 1, *p.* 67 *&* 71; *Newberry l. c. p.* 27, *f.* 5. Mountains of California, from Oregon to the southern boundary line. An evergreen oak, 30–40 feet high, with pale bark. The heart-wood is dark-colored, and it is said to be good timber. The acorns are often of great size and the cups extremely thick, as represented in my figure of Q. crassipocula, but sometimes not larger than those of the Live Oak (Q. virens). We adopt Liebmann's earlier name for this beautiful species.

QUERCUS DUMOSA, *Nutt. Sylv.* 1, *p.* 7? Near San Diego, California; *Parry.* A shrub, 5–8 feet high, and very densely branched. The leaves are sempervirent, ovate, and 8–10 lines long. Our specimens accord well with Nuttall's description; but he did not see the acorns. These are sessile, solitary and in pairs, about three-quarters of an inch long; the cup hemispherical; the gland ovate-oblong, tapering to a point and scarcely more than one-third of an inch in diameter at the base. Dr. Parry states in his notes, that the leaves are sometimes larger and oblong.

QUERCUS ACUTIDENS (n. sp.): foliis oblongis coriaceis basi acutiusculis vel cuneatis inequaliter grosse dentatis, dentibus cuspidatis pungentibus supra glabris nitidulis subtus pallidis minute tomentosis; fructibus sessilibus solitariis; cupula hemispherica, squamis incrassatis; glande oblongo-ovata. (TAB. LI.) Near San Luis Rey, California; *Parry.*—"Generally a low shrubby bush; but sometimes a tree 20 feet high." The leaves are 1½–2 inches long and 8–10 lines wide. The acorns are more than an inch long and much resemble those of the White Oak (Q. alba).

QUERCUS CONFERTIFOLIA, *H. B. K. Pl. Æquin.* 2, *p.* 53, *t.* 94? Near the Copper Mines, New Mexico; *Thurber*; No. 1869, *Wright.* Sierra del Pajarito, Sonora; *Schott.* San Francisco mountain; *Captain E. K. Smith.*—A small tree. Liebmann seems to have referred it to Q. cinerea, as he includes that species in his list of New Mexican Oaks (doubtless of Wright's collection) which he examined in the herbarium of Sir William Hooker, and Mr. Wright found no other Quercus in New Mexico resembling Q. cinerea. Our plant has thickly coriaceous, lanceolate, acute leaves, which are 3–4 inches long, and from three-quarters of an inch to nearly an inch broad. They are commonly entire and revolute on the margin, but occasionally show 1–3 minute teeth, nearly smooth and pale green above, very densely yellowish-tomentose underneath. The acorns are nearly sessile, solitary and in pairs; the cup hemispherical with broad, obtuse, pubescent scales, and the unripe acorn is ovate. Q. cinerea differs in its much thinner non-revolute leaves, and thin pale pubescence. The acorns also seem to differ, but we have not seen the ripe ones of Q. confertifolia.

RAFFLESIASÆ.

PILOSTYLES THURBERI, *Gray, Pl. Thurb. in Mem. Amer. Acad. n. ser.* 5, *p.* 326. (TAB. LII.) On a mountain near the Gila, June, parasitic on the branches of Dalea Emoryi; *Thurber.*

CONIFERÆ

EPHEDRA ANTISIPHILITICA, *Berland.; C. A. Meyer, Ephedr.* 101, *ex Endl. Syn. Conif. p.* 263. Western Texas, from the Nueces to the Rio Grande, and from Frontera to Eagle Pass, April, May. San Diego, California; *Parry.* Ranconado Pass, Cohahuila; *Thurber.* Between Mapami and Guajaquilla, Durango; *Gregg*, (No. 1882 and 1883, *Wright.*) The Mexicans call the plant

Tepopote and Cañatilla, and use a decoction of it as a remedy for gonorrhœa. It is a shrub about two feet high with numerous branches, the sheaths of which are short, 2–3-cleft, the divisions lanceolate or subulate, spreading or recurved, at length deciduous. Sterile aments opposite or aggregated at the nodes. Anthers mostly 4. Fertile opposite, 1–2-seeded. The sheaths of the ament mostly 4, deeply 2-cleft and somewhat fleshy. Seeds smooth, when in pairs flattened on the face, when solitary they are larger and obtusely triangular, nearly twice as long as the inner scales. Tube of the micropyle very obliquely truncated.

There are numerous specimens in the Mexican Boundary Collections, of an Ephedra, found at Frontera and near Doña Ana, which may be a distinct species, but I suspect it is an abnormal state of E. antisiphilitica. It is a shrub of 3 to 5 feet in height. The fertile aments are ovate-oblong, and instead of four decussating pairs of connate thickish, or at length succulent scales, there are from 16 to 20 very broad, entire, thin and membranaceous scales, which are distinct, contracted into a short stipe at the base, and irregularly inserted on the axis. They are at first loosely imbricated, but at length more or less spreading. The seed (immature) is ovate with a tapering point, and except the long obliquely truncated micropyle, is wholly covered with the scales.

Another Ephedra occurs at Fronteras, and it has also been found at Ojo de Vaca in Chihuahua, by Mr. Thurber. It resembles the one just noticed, but the scales, though equally numerous and arranged in the same manner, are smaller and less membranaceous. They are also minutely erose-serrulate. The seeds, however, are roughened with minute points which are sometimes disposed in short transverse rows, so that, unless pretty highly magnified, they look like wrinkles of the testa. The micropyle is conspicuously exserted beyond the scales. There are usually but two seeds in each fertile ament, but not unfrequently three. The arrangement of the scales of the fertile aments in these two Ephedræ is so much at variance with the character of the genus, that it seems most probable they are abnormal forms.

PINUS EDULIS, *Engelm. in Wisliz. Rep. p.* 88; *Torr. in Bot. Sitgr. Rep. p.* 173, *t.* 20, *& in Bot. Whippl. Rep. p.* 140. P. Fremontiana, *Gord. in Jour. Hort. Soc. Lond.* 4, *p.* 293, *cum ic. xyl.; excl. Syn. Endl. & Torr.* Mountains of western Texas, near the Rio Grande, New Mexico, Chihuahua, and Sonora. (No. 1889, *Wright;* No. 830, *Fendler;* New Mexico.) The cones and nuts greatly resemble those of the next species. The leaves are almost always in pairs, very rarely in threes. Gordon, in the work just quoted, refers this species to P. monophylla, *Torr. & Frém.*, the name of which, he says, was changed to P. Fremontiana by Professor Endlicher, (*Syn. Conif. p.* 183,) because that botanist having "afterwards examined more perfect specimens, found that the leaves were in twos and threes, and that the solitary leaves arose from Dr. Torrey's specimens being gathered from stunted plants." Now, we find that Endlicher in his Synop. Conif. has no remarks of this kind. His entire description is taken from mine in Frémont's 2d Report; but he regards what I call a single leaf, as consisting of two united leaves. Col. Frémont found extensive forests of the tree in his first expedition, as well as in his journey of 1853–'54. Dr. Bigelow also found it in Whipple's expedition on the mountains of California, but in consequence of an oversight it was not included in the Botanical Report of that expedition. The characters appearing to be so constant, I retain the species, and wait for additional observations on the plant in its native places of growth. It would be desirable, also, to test the constancy of the species by cultivation. Gordon's figure (l. c.) represents the ordinary state of P. edulis.

PINUS LLAVEANA, *Scheide & Deppe in Linnœa*, 12, *p.* 488. P. cembroides, *Newberry, in Pacif.*

Railroad Rep. 6, (*Bot.*) *p.* 44, *cum ic. xylog.* non *Zucc.* (TABLE LIII.) On the mountains east of San Diego; *Parry.* "A tree 30 or 40 feet high, and often 12 to 18 inches in diameter, with a round, even head. The young trees remarkably symmetrical, like some cedars, with the broad base resting on the ground, the trunk and branches being completely hidden by the dense foliage. The upper branches are usually loaded with cones." The leaves are mostly in fours, but sometimes in threes, and often in fives. They are crowded towards the summit of the branches, 1½ to 2 inches long, and a little curved. Cones about 2 inches long, globose-ovate, disposed near the extremity of the last year's growth, and are at a right angle to the branch. They are often somewhat gibbous, the convexity being upward. The scales are few, with the summit obtusely pyramidal. Seeds obovate, wingless, large for the size of the cone, with a thin fragile shell, and an edible kernel. The Indians collect large quantities of them for food. When fresh and slightly roasted they are very palatable. There can be little doubt of this being distinct from the Pinus cembroides of Mexico. The leaves of the latter are shorter and constantly in threes, and the cones are three or four times larger, with much more numerous scales.

PINUS PONDEROSA, *Dougl.; Newberry, l. c. p.* 36, *cum ic. xylog.* P. Engelmanni, *Torr. in Bot. Whipp. Rep. p.* 141. P. brachyptera, *Engelm. in Wisliz. Rep. p.* 89. Mountains near the Copper Mines, New Mexico. The leaves in some of the specimens are ten inches long. Dr. Newberry, who had abundant opportunity of studying the forest trees of New Mexico, California, and Oregon, in their native place of growth, has clearly shown (as we think) that P. brachyptera, *Engelm.*, is identical with the earlier published P. ponderosa, *Douglas*, to which species he also refers P. Benthami, *Hartw.*, and P. Beardsleyi, *Murr. in Edinb. New Phil. Jour.* 1855, *p.* 286.

PINUS MURICATA, *D. Don in Linn. Trans.* 17, *p.* 441; *Lindl. in Jour. Hort. Soc. Lond.* 4, *p.* 216, *cum ic. xylog.* P. Edgariana, *Hartw. l. c.* 3, *p.* 217. (TABLE LIV.) Near Monterey, California; *Parry* A small tree, seldom more than 15 or 20 feet high. Leaves of a deep vivid green. Our cones (which are, perhaps, not quite mature) are smaller than the one figured in the Hort. Trans. l. c.

PINUS CHIHUAHUANA, *Engelm. in Wisliz. Rep. p.* 103? Hills at the Copper Mines, New Mexico; *Bigelow.* (No. 1888, *Wright.*) Our specimens accord well with Dr. Engelmann's description, except that the apex of the scale, instead of being pointless, is armed with a small recurved prickle; but this is very fragile, and may have been rubbed off in the specimens collected by Wislizenus. The cones (not mature) are conical-ovate, rather pointed, about 2 inches long, and an inch and a quarter near the base. The leaves are remarkably slender.

PINUS INSIGNIS, *Dougl. in Loud. Arboret.* 4, *p.* 2265, fig. 2170–2172; *Torr. in Whipp. Rep. p.* 141. P. tuberculata and P. radiata, *D. Don.*—(Tab. LV.)—Near Monterey, California; *Parry.* Hartweg remarks (*Hort. Jour.* 2, *p.* 123) that in close woods, a mile or two from the shore, the leaves and cones are much larger than when the tree grows near the beach. Cones usually 3 or 4 together, and pendulous. They are almost always imperfect on one side, and thus are more or less gibbous.

PINUS DEFLEXA (n. sp.): foliis ternis longissimis(7–8-unc.) tenuibus, vaginis brevibus; strobilis ovatis acutis; squamarum apophysi compresso-pyramidata deflexa, umbone lato-uncinato recurvo; seminibus ala duplo brevioribus. (Tab. LVI.) Summit of the Cordilleras of California; *Parry.* "A handsome tree, with an even columnar trunk." This species is closely allied to P. rigida of the Atlantic States, but is sufficiently distinct. I have not been able to refer it to any Californian or Mexican pine hitherto described.

PINUS SABINIANA, *Dougl.; Lamb. Pin.* (*ed.* 2) 2, *p.* 146, *t.* 80; *Endl. Syn. Conif. p.* 159. (Tab. LVII.) Mountains east of San Diego, California; *Parry.* One of the largest of the California pines, being often from 60 to 100 feet high, and the trunk 2 to 4 feet in diameter. It is remarkable for its spreading branches, and for its large heavy cones with strong hooked scales The nuts are large and edible. Immense quantities of them are collected by the California and Oregon Indians, who depend upon them for a large portion of their winter food.

PINUS TORREYANA (*Parry MSS.*): foliis quinis elongatis (6–9-unc) rigidis, vaginis squamosis (5–10-lin.) strobilis subglobosis, squamarum apophysi elongato-pyramidata deflexa, umbone continuo obtuso subrecurvo. (TAB. LVIII and LIX.) Bluffs near the mouth of Solidad creek, 10 miles north of San Diego, California; *Parry.* A small tree, seldom more than 20 or 30 feet high, with a trunk 12 to 15 inches in diameter; often almost prostrate from its being exposed to strong ocean gales. Bark of the young branches whitish; the lower part of the trunk scaly. Branches horizontal, but curved upward towards the extremity. Leaves stouter than in any other North American pine, rough on the margin, abruptly pointed, the sheaths nearly two lines in diameter and an inch and a half long in the young leaves. Cones conical-globose, about 4½ inches long. Seeds, without the wing, three-fourths of an inch long, with a thick bony shell. This is the only pine of the section Pseudo-strobus found within the limits of our flora. P. Apulcensis which resembles it, differs in its more slender and shorter leaves, and ovate smaller cones, &c. It is also allied to P. Orizabæ, *Gordon in Lond. Hort. Jour.* 1, *p.* 237 *cum icon.*, but that has very slender leaves, which are extremely rough on the angle, and ovate cones.

PINUS LAMBERTIANA, *Dougl. in Linn. Trans.* 15, *p.* 50; *Lamb. Pin.* (*ed.* 2) 1, *p.* 57, *t.* 34; *Newberry, l. c. p.* 42, *fig.* 14. On the mountains east of San Diego, California; *Parry.*

ABIES DOUGLASII, *Lindl.; Nutt. Sylv.* 3, *p.* 136, *t.* 117; *Hook. Fl. Bor.-Amer.* 2, *p.* 162, *t.* 115; *Newberry, l. c. p.* 54. *fig.* 20 *& t.* 8. Mountains east of San Diego, California; *Parry.* Mountains of western Texas and New Mexico; *Bigelow.* A noble tree, 50–100 feet high. In Oregon it sometimes attains the height of 300 feet.

TAXODIUM DISTICHUM, *Rich. Conif. p.* 52, *t.* 10. Cupressus disticha, *Linn.; Michx. f. Sylv.* 2, *p.* 329, *t.* 151. Valley of the Rio Grande below the mouth of Los Moros, in western Texas, Cohahuila, and Neuvo Leon. (No. 2213, *Berlandier.*) Below the Salado this noble tree is often seen in the river itself, sometimes where the water is 16 feet deep and the current strong; *Schott.* Dr. Bigelow found it at Santa Rosa, Cohahuila, flowering in January.

SEQUOIA SEMPERVIRENS, *Endl. Conif. p.* 198; *Newberry, l. c. p.* 57, *fig.* 23. Taxodium sempervirens, *Lamb. Pin.* (*ed.* 2) 2, *t.* 64. Woods in the Coast Range of mountains east of Monterey, south of which it is very rare. This is the celebrated *redwood* of California; the most valuable timber tree of that State.

JUNIPERUS TETRAGONA, *Schlecht.* var. OSTEOSPERMA, *Torr. in Whippl. Rep. p.* 141. Dry rocky places, San Felipe, &c., California; *Parry.* A much branched shrub of regular conical form, 6–13 feet high.

JUNIPERUS PACHYPHLÆA, *Torr. l. c.* Hill sides, western Texas, New Mexico, Chihuahua, and Sonora. The fruit varies from 3 to 5 lines in diameter, and is sometimes only two-seeded. When unusually large it sometimes contains 4 and even 5 seeds.

JUNIPERUS OCCIDENTALIS, *Hook. Fl. Bor.-Amer.* 2, *p.* 166; *Torr. l. c.; Newberry l. c. p.* 59, *t.*

10. J. Andina, *Nutt. Sylv.* 3, *p.* 95, *t.* 110. Rocky places, valley of the Pecos; *Bigelow.* It is also a native of California and Oregon.

Juniperus Virginiana, *Linn.; Michx. Sylv.* 2, *p.* 353, *t.* 156. Rocky hills, western Texas; *Bigelow.*

Libocedrus decurrens, *Torr. in Smithson. Contrib.* 6, *p.* 7, *t.* 3, *& in Whippl. Rep. p.* 140. Summit of the mountains east of San Diego, California; *Dr Parry.* A noble tree; sometimes 150 feet high. The wood resembles that of the white cedar.

Thuja gigantea, *Nutt. in Jour. Acad. Phil.* 7, *p.* 52; *& Sylva.* 3, *p.* 102 *t.* 111; *Newberry, l. c. p.* 57, *fig.* 22. Near San Diego and other parts of California; *Parry.* This is the *Arbor vitæ* of California and Oregon. It occurs as far north as Nutka Sound.

Cupressus macrocarpa, *Hartw. in Jour. Hort. Soc. Lond.* 2, *p.* 187, *&* 4, *p.* 296, *cum icon. xylogr.* C. Macnabiana, *Murray in Edinb. New Phil. Jour., April,* 1855? Near the seashore at Monterey, California; *Parry.* A tree often 30 feet or more in height, with a trunk 18 inches in diameter. Hartweg states that he has seen it 60 feet high, with a trunk of 3 feet in diameter. The head is usually depressed and very dense. Branchlets distinctly quadrangular, rigid, and stouter than in J. Virginiana. Leaves closely imbricated, rhombic-ovate, obtuse, very thick, depressed each side of the blunt keel. Sterile aments globose-ovate, 1½ line long. Anthers 4-celled. Fruit the size of a large nutmeg, globose. Scales 6, thick and woody, irregularly 4 to 5-angled, each with a strong excentric protuberance or blunt point. They are closely joined at first, but at length separate from one another. Seeds 6 to 8 under each scale, angular by compression, narrowly winged.

Cupressus Goveniana, *Gordon in Jour. Hort. Soc. Lond. l. c. p.* 295, *cum icon. xylogr.* On the mountains east of San Diego, California; *Parry.* A shrub 6 to 10 feet high, slender, and moderately branched. Leaves as in C. macrocarpa, except that they are less appressed. Sterile aments numerous, oblong. Fruit 4 to 6 lines in diameter; scales 10, mucronate in the depressed centre. Dr. Parry thinks he has seen forms intermediate between this and the last species, but none such were among his specimens.

LEMNACEÆ.

Lemna trisulca, *Linn.; Kunth, Enum.* 3, *p.* 5; *Torr. Fl. N. York,* 2, *p.* 246. On the San Felipe creek below the mouth of the Pecos; *Bigelow, Schott.* On the Mimbres, New Mexico; *Thurber.* (No. 1890, *Wright.*)

Lemna minor, *Linn.; Kunth, l. c.; Torr. l. c.* In running water, San Luis Rey, California, associated with Azolla; *Parry.* Cimieluque Springs, Chihuahua; *Bigelow.* (No. 1892, *Wright.*) The specimens are without flowers or fruit, so that we are not certain of the species.

Lemna polyrrhiza, *Linn.; Kunth, l. c.; Torr. l. c.* On the surface of water, borders of the Limpia and other streams, Texas; *Bigelow.* Cimieluque Springs, Chihuahua; *Wright.*

TYPHACEÆ.

Typha latifolia, *Linn.; Kunth, Enum.* 3, *p.* 90; *Torr. Fl.* 2, *p.* 247. In water, Painted Caves, western Texas; *Bigelow.*

NAIADACEÆ.

Naias flexilis, *Rostk.; Kunth, Enum.* 3, *p.* 114. N. Canadensis, *Michx. Fl.* 2, *p.* 220; *Torr. Fl. N. York,* 2, *p.* 250. Western Texas; *Bigelow, Wright.*

ZANNICHELLIA PALUSTRIS, *Linn.; Kunth, Enum.* 3, *p.* 124; *Torr. l. c. p.* 253. Slow-flowing streams and stagnant waters, western Texas, Chihuahua, and Sonora.

POTAMOGETON PECTINATUS, *Linn.; Torr. Fl. New York*, 2, *p.* 247. P. marinum, *Linn.*; *Michx. Fl.* 1, *p.* 102. Flowing water near San Diego, California; *Parry.* Tucson, Sonora; *Schott.* (No. 1895, *Wright.*)

POTAMOGETON HYBRIDUS, *Michx. Fl.* 1, *p.* 101; *Torr. l. c.* In water on the prairies of the Guadalupe river, Texas, May; *Wright.*

POTAMOGETON PAUCIFLORUS, *Pursh*, *Fl.* 1, *p.* 121; *Torr. l. c.* P. gramineus, *Michx. Fl.*, *p.* 102, non *Linn.* Stagnant water of the Limpio, July; *Bigelow.*

POTAMOGETON LUCENS, *Linn.; Kunth, Enum.* 3, *p.* 132; *Torr. l. c. p*, 255. San Antonio, Texas, to the Rio Grande.

POTAMOGETON NUTANS, *Linn.; Kunth, Enum.* 3, *p.* 127; *Torr. l. c. p.* 253. Waters of the Limpio, Texas; *Bigelow.* Ojo Caliente, Chihuahua; *Thurber.* Los Noyales, Sonora; *Capt. E. K. Smith.*

ALISMACEÆ, by Dr. George Engelmann.

SAGITTARIA SIMPLEX, *Pursh, Fl.* 2, *p.* 397; *Gray, Man. ed.* 2, *p.* 439. In ponds, western Texas; *Wright.*

SAGITTARIA CALYCINA (Engelm. MSS): pedicellis fertilibus sterilia æquantibus; fructiferis recurvatis; floribus omnibus hermaphroditis, fertilibus subdodecandris, sterilibus polyandris ovaria pauca sterilia gerentibus; filamentis subulatis læviusculis seu tenuiter papillosis antheram late ovatam subæquantibus seu paullo superantibus; stylo erecto ovario longiore in carpellis maturis obovatis duplo longioribus horizontali; sepalis orbiculatis carpellorum capitatum arcte involventibus.

Var. *a.* MAXIMA: foliis maximis sinu latissimo hastatis, lobis divaricatissimis tenuiter subulato-appendiculatis; scapo robusto ramoso; bracteolis lanceolatis acutis; verticillis fructiferis pluribus capitulis magnis.—On the Red river, Louisiana; *Dr. Hale.*

Var. *β.* MEDIA: foliis minoribus sinu latissimo hastatis lobis divaricatis s. divaricatissimis acuminatis; scapo debili simplici verticillo infimo solum (raro duobus) fructifero; bracteis ovatis obtusis; capitulis minoribus.—Saline swamps, Jefferson county, Missouri; *Engelmann.*

Var. *γ.* FLUITANS: foliis oblongo-linearibus fluitantibus; scapo debili verticillis sæpe 1–2-floris; bracteis obtusis; pedicellis elongatis inequalibus; capitulis minoribus.—Ponds and slow-flowing waters, western Texas. *Wright*, No. 1899. Also in Missouri, and in the Merrimac river, Massachusetts; *Engelmann.*

[Dr. Bigelow collected near San Elceario, on the Rio Grande, a Sagittaria which was overlooked when Dr. Engelmann revised the genus in my herbarium in 1856. It seems to be the same as a plant from western Texas, which Dr. E. named, provisionally, *S. longiloba*, and which he regarded as very near S. simplex. We can find no sufficient characters for distinguishing it from that species. The leaves, however, are sagittate, with very long, narrow, and widely diverging lobes, a state in which we have never seen S. simplex. J. T.]

ORCHIDACEÆ.

PLATANTHERA LEUCOSTACHYS, *Lindl. Gen. & Spec. Orch. p.* 288; *Hook. Fl. Bor.-Amer.* 2, *p.* 198. Santa Cruz, Sonora; *Thurber.* Near Montery, California, June. (No. 1900, *Wright*, a slender variety.) We have what we regard as the same species, from Mokelumne and Monterey, California, collected by Mr. Rich, and from Observatory Inlet, British America. Mr. Rich's specimens show a transition from the stouter form, with a dense inflorescence, to the slender variety, with more scattered flowers, of the plant collected by Dr. Parry.

PLATANTHERA DILATATA, *Lindl. p.* 287; *Torr. Fl. N. York*, 2, *p.* 267. Mountains east of San Diego, California, May; *Parry.*

EPIPACTIS GIGANTEA, *Dougl. in Hook. Fl. Bor.-Amer.* 2, *p.* 202, *t.* 202. Moist ravines near the mouth of the Pecos; *Bigelow.* (No. 1901, *Wright.*) The leaves in Mr. Wright's specimens are narrower than in the Californian plant, but in Dr. Bigelow's they are quite as broad.

BLETIA APHYLLA, *Nutt. Gen.* 2, *p.* 194. Western Texas; *Wright.* Sepals deep brownish purple. Petals dull brownish yellow; the 3-lobed lip with 5 broad plaits or folds, purplish.

AMARYLLIDACEÆ.

HABRANTHUS ANDERSONI, *Herb. in Lindl. Bot. Reg. t.* 1345: Var. TEXANUS, *Bot. Mag. t.* 3596. Western Texas, from San Antonio to the Rio Grande, October. The peduncles are often 6 inches long. (No. 1904, *Wright.*)

COOPERIA PEDUNCULATA, *Herb. Amaryll. p.* 179, *t.* 42, *f.* 3–5, *& in Bot. Mag. t.* 3739. Prairies, Texas, from the Blanco river to the Rio Grande; also in Nuevo Leon, March—October. (No. 1902, *Wright.*)

COOPERIA DRUMMONDI, *Herb. in Bot. Reg. t.* 1835. On hills San Antonio, Texas, to the Rio Grande, August—October. (No. 1902, *Wright.*)

AGAVE AMERICANA, *Linn. Sp. p.* 461; *Kunth, Enum.* 5, *p.* 819. Western Texas, bordering the Rio Grande, and in the Mexican States, west; also on the Gila. (No. 1906, *Wright?*) This is one of the species called *Maguey* by the Mexicans. It is an exceedingly useful plant, as will be seen from Mr. Schott's notes. In many parts of Mexico, where it is now very common, it has doubtless been introduced.

AGAVE AMERICANA, *β?* LATIFOLIA: foliis ovatis acuminatis; floribus minoribus. Hills near the Copper Mines of New Mexico; *Emory;* and near Rock Creek; *Bigelow.* The leaves are more than a foot long and 4 or 5 inches wide, forming a cone which is from 2½ to 3 feet in diameter; the margin armed with short spreading or reversed prickles. From the centre rises a flower stalk to the height of 10 feet. Only the withered and somewhat persistent flowers were collected. These are scarcely one-third as large as those of the narrower leaved plant. The capsule is smooth, oblong, an inch and a half long, and three-fourths of an inch in diameter. We are yet in doubt as to whether this is a distinct species from A. Americana. Both are called *Maguey* in some parts of New Mexico and on the Gila, but sometimes the latter only is so named, and the other Mescal.

AGAVE LECHEGUILLA (n. sp.?): foliis anguste lanceolatis crassis patulis margine remote aculeatis; spica longissima; floribus subsessilibus sæpissime per paria approximatis; perianthii segmentis (uncialibus) erectis.—Mountains near El Paso, and along the Rio Grande downward; common, growing in patches, May—June. (No. 682 and 1907, *Wright.*) Caudex 4–6 inches high. Leaves 12–15 inches long and 1–1½ inch wide, thick, rounded underneath and somewhat channelled above, terminating in a stout spine, the margin armed with short strong hooked prickles, which are usually reversed. Scape 6–10 feet long, the upper part pretty thickly covered with flowers, which are mostly in pairs (the lowest in threes) and arise from very short (1–2 lines) forked peduncles or branches. Bracts lanceolate from a broad clasping base, 2 lines long, deciduous. The perianth above the ovary is about an inch long, white with a tinge of yellow, and the segments are narrowly-oblong. Stamens and style much exserted. Stigma clavate, obtuse, obscurely 3-lobed. Capsule about an inch long and half an inch in diameter, erect, obtusely triangular, with a short abrupt acumination. Seeds in a double series, semiorbicular, compressed vertically, black and shining. We cannot identify this species among those described by *Kunth* and later writers. The fibres of the leaves are used for making coarse ropes, bagging, etc.

AGAVE GEMINIFLORA, *Gawl. in Brand's Jour. Sc.* 1, *t.* 1? var. SONORÆ: foliis angusto-linearibus elongatis crebris superne concavis, subtus rotundatis, apice terretibus convolutis in spinam terminalem excurrentibus, margine filamentosis; spica longissima, floribus per paria approximatis; perigoniis (uncialibus) tubuloso-infundibuliformibus.—Sierra del Pajarito, Sonora, August; *Schott.* Leaves all radical, 6–12 inches long and 3–4 lines wide; the margin splitting off into very fine white threads and entirely destitute of spines or serratures. Scape (including its spike) 5–6 feet high. The flowers in pairs on very short erect stalks. The perianth above the ovary is about an inch long, with a somewhat funnel-form tube, and narrowly oblong segments, which are at first a little spreading, but afterwards erect. Stamens and style exserted and the linear anthers, as usual, very large for the size of the flower.

AGAVE PARVIFLORA (n. sp.): acaulis; foliis lineari-lanceolatis basi valde dilatatis infra medium margine catilagineo-denticulatis, ultra medium filamentosis; spica elongata; pedunculis brevissimis dissitis 2–4-floris; perianthiis (vix semiuncialibus) subcampanulatis, laciniis breviovatis; capsulis subglobosis.—On various sierras of Pimeria Alta, Sonora; *Schott.* Leaves all in a radical cluster, 2½–3 inches long and about half an inch wide, thick, much dilated at the base; the margin below the middle furnished with minute but evident cartilaginous teeth, while on the upper half the margin bears rather stout white threads; the spiny tip is not more than 2–3 lines long. Scape 4–5 feet long; the clusters of flowers more scattered than in the last species. Only the withered persistent flowers were collected. These when soaked were scarcely half an inch long and whitish with a tinge of rose-color. Stamens and style exserted. Capsule 4–5 lines long and of nearly the same diameter. Seeds as in the last species. This is possibly A. filifera, *Salm-Dyck*, a species of which the flowers and fruit are not described.

AGAVE VIRGINICA, *Linn.; Michx. Fl.* 1, *p.* 187; *Kunth*, *Enum.* 5, *p.* 833. Hills on the Rio Grande from El Paso down to Laredo, April—August. (No. 683 and 1905, *Wright.*)

I subjoin a description, by Dr. Engelmann, of a species of Agave found at Eagle Pass on the Rio Grande, (probably collected by Mr. Schott,) of which there are no specimens in the collections:

AGAVE MACULATA (Engelm.): radice crassa cylindrica nigra; foliis radicalibus lanceolato-linearibus longe acuminatis subtus convexis supra profunde concavis recurvatis glaucis maculis atro-virentibus notatis, margine albido cartilagineo-dentatis apice acutis nec spinescentibus; scapo basi foliis paucis instructo; floribus in spicam simplicem dispositis brevissime pedicellatis; tubo corollæ superne vix ampliato, laciniis lineari-oblongis rotato-patentibus.—Eagle Pass on the Rio Grande. Root 6–8 lines in diameter, 4–6 inches long, black, with long thick white fibres. Leaves 4–6 inches long, ½ an inch wide, deeply channelled, but not carinate, very glaucous, the dark greenish brown blotches more distinct on the upper than the lower surface. Scape 1½–2 feet high. Spike about 6 inches long, with 12–15 flowers. Bracts subulate, longer than the pedicel, which is about one line long and articulated in the middle. The flowers, which are of musky not disagreeable odor, are about 20‴ long; ovary 6‴, tube 9‴, the limb about 6‴. Laciniæ of the perianth at first green, afterwards on both sides (with the filaments) of a dirty purplish color Evidently near A. revoluta, *Klotzsch;* but that species has smooth-margined leaves; limb of the perianth equal to the tube; stamens free in the tube and longer than the limb. To Polyanthes Mexicana, Zucc. (which Kunth in Enum. 5, p. 847, says, is probably a species of Agave) it is still more nearly related, but that has leaves entire on the margin, with reddish dots; flowers white, in pairs and sessile, the tube 18 lines long, segments only 3–4 lines long. Capsule (immature) ovate oblong obtusely triangular. Nothing is said of the fragrance of the flowers.

BROMELIACEÆ.

TILLANDSIA RECURVATA (*Linn.; Le Conte in Ann. Lyc. N. York*, 2, *p.* 132): cæspitosa; foliis subdistichis filiformibus teretibus anguste canaliculatis cinereo-lepidotis recurvatis; pedunculis folio longioribus unifloris glabriusculis; bracteis 2–3 acuminatis calyce longioribus.—On trees, near the Rio Coleto, Texas; *Thurber.* On oaks and grape vines, Los Moros; *Bigelow.* Lower Rio Grande; *Schott.* San Fernando, Mexico; *Berlandier*, No. 818. The specimens are all in fruit, and the peduncles mostly one-flowered.

TILLANDSIA USNEOIDES, *Linn.; Ell. Sh.* 1, *p.* 379; *Le Conte, l. c.* On trees, western Texas, not found on the Rio Grande above the mouth of the Pecos.

DASYLIRION TENUIFOLIUM (n. sp.): caudice brevissimo; foliis linearibus gramineis planis vix rigidulis nitidis margine spinuloso-scaberrimis; panicula elongata, ramis simplicibus distantibus sublaxifloris, basi subnudis; pedicellis flore sublongioribus; fructibus membranaceis, lobis carinatis vix alatis; seminibus oblongo-obovatis. Among rocks, borders of the Sabinal river; *Wright*, (No. 1919.) Stony places on the high plateau of the upper Guadalupe, Texas; *Lindheimer.* Caudex short and almost subterranean. Radical leaves about a foot long, 2–2½ lines wide, bright green and shining on both sides, much thinner in texture than in any other species of this genus, those of the scape gradually smaller. Stem or scape (including the panicle) about 3 feet high. Branches of the panicle 2–3 inches long. Flowers solitary or somewhat fasciculate. Perianth scarcely a line and a half in diameter. Ovary 3-celled, with 2 erect ovules in each cell; stigmas 3, oblong, sessile. Fruit rather broader than long, 3-lobed, one or two of the seeds commonly abortive. Seed minutely reticulate-rugose. Remarkable for the thin leaves and long naked panicle.

DASYLIRION GRAMINIFOLIUM, *Zucc. Pl. Nov. v. Min. Cog. fasc.* 4, *p.* 225, *t.* 1. Hill sides and table land, western Texas, New Mexico, Chihuahua, and Sonora, westward to the Colorado. Neuvo Leon; *Berlandier*, (No. 3211. No. 694, *Wright.* No. 70, 212, 212, 419, and 549, *Fendler.*) Caudex 3–5 feet high, the upper part clothed with the long spiny-serrated recurved leaves. Scape 6–8 feet high. Flowers in a long dense panicle of close spikes, which are subtended by broadly lanceolate clasping foliaceous spathes. The male flowers with a sterile ovary, and the female with sterile anthers. Bracts and bracteoles broadly ovate, acuminate serrate-lacerate, scarious. Perianth white; the segments obovate, concave. Ovary ovate, obtusely triangular, one-celled, with 6 anatropous erect ovules at the base of the cavity. Fruit coriaceous, narrowly winged, indehiscent. Seed 3-sided, with obtuse angles, smooth. Embryo cylindrical, in the axis of horny albumen, which it nearly equals in length. D. Texanum *Scheele*, seems to be hardly distinct from this species.

DASYLIRION BIGELOVII, *Torr. Bot. Whipp. Rep. p.* 151. Sierra del Tule y Tinaja Alta, Sonora; *Schott.* "Stem 6 feet high, and 2–3 feet in diameter." Leaves 3–5 feet long, and nearly an inch in diameter about the middle, flat; the margin a little rough, and sometimes separating into threads. "Scape 6–8 feet long. Raceme 1–1½ foot long, and nearly a foot in diameter at the base." Fruit papyraceous, 1 or 2 of the cells usually sterile, not opening by regular dehiscence, but by the rupture of the thin walls. Seeds oblong-obovate, whitish, dull, slightly reticulated. Embryo slender, cylindrical, in the axis of horny albumen.

DASYLIRION LINDHEIMERIANUM, *Scheele in Linnæa*, 25, *p.* 362. High plains and hill sides near the Copper Mines, New Mexico; *Bigelow.* El Podrero, Sonora; *Schott.* (No. 693, *Wright.* No. 213, 297, 551, 552, *Lindheimer.*)—All our specimens are in fruit. Leaves a yard long, and about 3 lines wide towards the base, channelled above, rounded underneath. Pedicels filiform, thickened and triangular at the base of the flower. Fruit membranaceous, nearly twice as broad as long, and exceeding the pedicels in length, conspicuously 3-winged, only one of the cells usually fertile, and this containing but a single obovate seed.—This species seems to be very like D. Hartwegianum, *Kunth.* D. Bigelovii, which it also resembles, differs in its much larger fruit, broader leaves, and short pedicels.

DASYLIRION ERUMPENS (n. sp.): foliis lineari-ensiformibus e basi non attenuatis superne angusto-filiformibus supra canaliculatis infra semiteretibus margine serrulato-scabris; spathis e basi lata longissime angustissimeque attenuatis; pedicellis vix flore æqualibus; fructibus trilobis trilocularibus lobis carinatis vix alatis; seminibus globosis. Hills and gravelly places, western Texas and New Mexico, June. (No. 1918, *Wright.*) Leaves 2½–3 feet long, about 3 lines wide toward the base, tapering to a long, almost filiform extremity, rigid; the margin rough, with minute cartilaginous serratures. Panicle compound; the spathaceous bract at the base of each primary branch dilated and clasping below, then tapering to a long filiform point. Pedicels jointed near the middle. Flowers white, about 2 lines long, the male (as usual) bearing imperfect anthers, and the female an infertile ovary. Capsule with one or two of the cells often without seeds, the angles prominent and acute, but not winged. Seeds when near maturity, bursting the pod, and then remaining for some time attached to the placenta.

IRIDACEÆ.

IRIS MACROSIPHON, *Torr. Bot. Whip. Rep. p.* 144. Near San Francisco, and in Napa county, California, March; *Thurber.*

SISYRINCHIUM BERMUDIANA, *Linn.*; var. MUCRONATUM. San Diego, California, May; *Thurber.* Western Texas; common along the Rio Grande; also in New Mexico, near the Copper Mines. S. minus, *Engelm. & Gray*, (*Pl. Lindh.*, No. 313,) can hardly be considered a distinct species from this, as intermediate forms not unfrequently occur.

NEMASTYLIS ACUTA, *Engelm. & Gray, Pl. Lindh.* 1, *p.* 27 (*adnot.*) N. geminiflora, *Nutt. in Trans. Amer. Phil. Soc.* (*n. ser.*) 5, *p.* 157. Ixia acuta, *Bart. Fl. N. Am.* 1, *t.* 76. Western Texas, *Thurber.* Mountains of Muerte; *Bigelow.*

TRIFURCIA CÆRULEA, *Herb. in Bot. Mag. sub t.* 3779. Prairies of the Colorado, Texas; *Wright.*

SMILACEÆ.

Smilax tamnoides, *Linn. sp. p.* 1460. Piedra Pinta, western Texas (in fruit); *Bigelow.* An extremely variable species, of which S. Bona nox, S. hastata and S. pandurata are doubtless mere varieties. My friend, Dr. Chapman, who has carefully studied, in a living state, the Florida species of this genus, thinks that S. Beyrichii, S. Sprengelii and S. hederæfolia of Kunth are also forms of S. tamnoides.

Trillium sessile, *Linn. Spec. p.* 284, var. angustipetalum, *Torr. Bot. Whippl. Rep. p.* 151. Moist places near Monterey and San Luis Obispo, California, March—April; *Parry.* Napa county, in the same State; *Thurber.*

LILIACEÆ.

Fritillaria lanceolata, *Pursh, Fl.* 1, *p.* 230. F. mutica, *Lindl. Bot. Reg. fol.* 1663? (Tab. LXI.) In pine woods near Monterey, California, February—April; *Parry;* also in Napa county; *Thurber.* The leaves of Dr. Parry's specimens are unusually narrow.

Fritillaria Kamtschatcensis, *Fisch. in Hook. Fl. Bor.-Am.* 2, *p.* 181, *t.* 193, *A.* San Lusi Rey and San Luis Obispo, California; *Parry.*

Calochortus uniflorus, *Hook. & Arn. Bot. Beech. p.* 398, *t.* 94. Monterey, California, May; *Parry.*

Calochortus venustus, *Benth. in Hort. Trans.* (*n. ser.*) 1, *p.* 411, *t.* 15, *f.* 3. Monterey, California, May; *Parry.* Near the Copper Mines, New Mexico, May—June; *Bigelow.* San Luis mountains, Sonora; *Capt. E. K. Smith.*

Calochortus luteus, *Dougl.; Lindl. Bot. Reg. t.* 1661. San Diego, California, May; *Parry.*

Calochortus splendens, *Benth. l. c. p.* 411, *t.* 15, *f.* 1. San Diego, California, May—June; *Parry, Thurber.*

Cyclobothra alba, *Benth. l. c. p.* 413, *t.* 14, *f.* 3. Monterey, California, May; *Parry.*

Allium cernuum, *Roth; Bot. Mag. t.* 1134; *Kunth, Enum.* 4, *p.* 435. Hills near the Copper Mines, New Mexico, July; *Bigelow.* (No. 1913, *Wright.* No. 848, *Fendler.*)

Allium reticulatum, *Nutt. in Fraser, Cat.; Hook. Fl. Bor.-Am.* 2, *p.* 184, *t.* 195; *Kunth, l. c.* Hill sides and prairies. Western Texas to the Rio Grande and Chihuahua; also in New Mexico west to the Copper Mines, April. (No. 1915 and 1916, *Wright.*)

Allium mutabile, *Michx. Fl.* 1, *p.* 195; *Kunth, Enum.* 4, *p.* 451. Gravelly hills, western Texas; *Wright.* Presidio del Norte on the Rio Grande, and in other places on that river; *Bigelow.* Chihuahua; *Thurber.* The bulb is commonly single, ovate, and 1–1½ inch long. Leaves narrowly linear, shorter than the scape, which is about a foot long. Umbel 15–40-flowered. Spathe 2–3-valved. Perianth rose color, sometimes very pale; the segments ovate-lanceolate, acute. Stamens about two thirds the length of the perianth; filaments subulate, gradually and moderately dilated downward; anthers oblong. Cells of the ovary 2-ovulate. Capsule subglobose, 3-lobed; the cells rounded at the summit, usually perfecting but a single ovate black seed.

Allium acuminatum, *Hook. Fl. Bor.-Am.* 2, *p.* 185, *t.* 196. San Diego, near the boundary line; *Parry.* New Almaden, California; *Thurber.*

Allium (Hesperoscordium) maritimum, *Torr. Bot. Whippl. Rep. p.* 149; *Benth. Pl. Hartw. p.* 339. Sandy places near Monterey, California, March; *Parry.*

ALLIUM (NOTHOSCORDIUM) STRIATUM, *Jacq.; Bot. Mag. t.* 1035; *Ell. Sk.* 1, *p.* 385. Prairies of western Texas and along the Rio Grande; common; flowering from March to September. Janos, Coralitas river, Sonora; *Capt. E. K. Smith.*

Sub-genus CHRYSOSCORDIUM. Sepala basi vix connata, erecto-patentia, uninervia. Filamenta filiformia, basi utrinque unidentata. Ovarium sessile: ovula in loculis 4–5. Herba Californica scapigera, bulbosa? ; foliis linearibus; floribus umbellatis aurantiacis.

ALLIUM (CH.) CROCEUM (n. sp.) Summit of the mountains east of San Diego, California; *Parry.* Leaves all radical, about a foot long and 2½ lines wide, glabrous. Scape as long as the leaves, slender, terete, naked. Umbel 9–12-flowered; the pedicels 8–10 lines long, spreading, articulated close to the flower. Spathe of 4–5 lanceolate acuminate valves, which are nearly distinct to the base. Sepals 4–5 lines long, orange-yellow, oblong, rather obtuse, with a ciliolate callosity at the tip. Stamens one fourth shorter than the sepals; filaments filiform, with an oblong adnate tooth on each side at the base. Ovary oblong; style about as long as the sepals, filiform; stigma very small, 3-lobed. Capsule (immature) obovate; seeds compressed. This species resembles a small Calliproa lutea. It differs from most of the genuine species of Allium in its yellow flowers, more numerous ovules, and articulated pedicels.

CAMASSIA FRASERI, *Torr. in Bot. Whippl. Rep. p.* 147. Scilla esculenta, *Ker.* S. Fraseri, *Gray, Man. ed.* 2, *p.* 469. Prairies of western Texas; *Wright.*

BRODIÆA (DICHELOSTEMMA) CAPITATA, *Benth. Pl. Hartw. p.* 339. Dichelostemma congestum, *Torr. Bot. Whippl. Rep. non Kunth.* Near Monterey, California, *Parry;* and Napa valley, in the same State; *Thurber.* Until very recently, I had never seen the true B. congesta; all the numerous specimens of what I have taken for it having 6 perfect stamens. As an early figure of Hookeria pulchella, *Salisb.*, which several botanists have referred to B. congesta, represented the flowers as hexandrous, I supposed that the fertile stamens were commonly 6. I have, however, just examined a Brodiæa from Oregon, which exactly accords with Smith's description of B. congesta. Nevertheless it is possible that the usually abortive stamens are sometimes antheriferous.

Var.? PAUCIFLORA: umbella 2–4-flora; pedicellis valde inæqualibus partim spatha 3–4-valva subduplo longioribus. Near the Copper Mines, New Mexico; *Bigelow.* On the Gila river, March; *Parry.* San Francisco Spring, Sonora, *Capt. E. K. Smith.* This may prove a distinct species; for we have seen no intermediate forms.

BRODIÆA GRANDIFLORA, *Smith, l. c.; Kunth. Enum.* 4, *p.* 471; *&* var. MACROPODA, *Torr. Bot. Whippl. Rep. p.* 149. San Pasqual, California, May; *Thurber.*

CALLIPROA LUTEA, *Lindl. Bot. Reg. t.* 1590; *Kunth, Enum.* 4, *p.* 476. Dry grassy hill sides, near Monterey, California, May; *Parry.*

CHLOROGALUM POMERIDIANUM, *Kunth, Enum.* 4, *p.* 682. Anthericum pomeridianum, *Gawl. Bot. Reg. t.* 561. (TAB. LX.) Pinasquitos, California, May; *Thurber.*

ANDROSTEPHIUM, Nov. Gen.

Perianthium corollaceum, infundibuliforme, 6-fidum, regulare, persistens; laciniis tubo subæqualibus patulis uninerviis. Stamina 6, omnia fertilia; filamentis superne in tubum brevem cylindraceum connatis, inter et ultra antheras biloculares introrsas dorso medium affixas in coronam 6-foliolatum productis. Ovarium sessile, oblongum, 3-loculare; loculis 12–14-ovulatis:

stylus filiformis, stamina æquans; stigma capitato-trilobum. Capsula late-obovata, truncata, 3-loba, lobis compressis. Semina in loculis 8–14, verticalia, compresa, biseriata, nigra. Herba bulboso-tuberosa. Folia omnia radicalia, linearia, semi-cylindrica. Flores in apice scapi umbellati, pedicellati, violacei, bracteis 3–4 involucrati; pedicellis inarticulatis.

ANDROSTEPHIUM VIOLACEUM.—Hills and prairies on the rivers Blanco and Colorado, Texas, March; *Wright*. We have excellent specimens from Dr. R. Gleason, United States army, collected near Fort Arbuckle; and it occurs in Lindheimer's Texan collection fasc. IV. Leaves 6–8 inches long and 1–2 lines wide, arising from a small coated bulb which surmounts a depressed globose bulb or corm. Scape about as long as the leaves, rather stout, bearing at the summit an umbel of 2–7 flowers, which have a faint sweet odor. Bracts scarious, lanceolate, acuminate, 3-nerved. Pedicels rather shorter than the flower. Perianth nearly an inch long, 6-cleft nearly to the middle, the segments more or less spreading, oblong, obtuse. Stamens 6, the free portion of the filaments united into a tube which arises from the orifice of the perianth is conspicuously exserted, and produced between and beyond the anthers into a crown of 6 oblong emarginate lobes. Anthers linear-oblong, notched at each end. Style about as long as the stamens. Ovary entirely free from the base of the perianth. Capsule sessile, with 3 very prominent laterally compressed lobes or cells, which open loculicidally. Seed suborbicular, laterally much compressed and narrowly winged, vertically imbricated in a double series. Embryo slender, cylindrical, a little curved in the axis of fleshy albumen. The Mexican genus Bessera most resembles this, but it differs in the very short tube of the perianth, in the tube of filaments having only a short tooth between the filaments, and in the form of the capsule.

MILLA BIFLORA, *Cav. Ic.* 2, *p.* 76, *t.* 196, *ex Kunth, Enum.* 4, *p.* 478. M. cærulea, *Scheele in Linnæa*, 25, *p.* 260. On the Rio San Pedro, Sonora; *Schott, Thurber.* No. 1913, *Wright.* Scape 1–3-flowered. Bulb subglobose, clothed with light brown scales. Our plant wholly resembles Mexican specimens collected by Dr. Halsted and others.

ECHEANDIA TERNIFLORA, *Ortega; Kunth, Enum.* 4, *p.* 627. Var.? ANGUSTIFOLIA: foliis 2–4 lin. latis, pedicellis infra medium articulatis; ovarii loculis sub-16-ovulatis. Copper Mines, New Mexico; rocky places near the mouth of the Pecos, and near Rock Creek, July—August; *Bigelow;* (No. 69 and 1912, *Wright.*) Cretaceous hills and ravines near the Pecos; *Schott.* Monterey, Mexico; *Dr. Edwards.* New Mexico, *Fendler*, No. 851. Root a fascicle of thick fleshy fibres. Leaves usually less than 3 lines wide. Stem scapiform, 1½–3 feet long, very slender, often nearly simple above, but more commonly somewhat paniculately branched, the branches erect. Flowers 2–4 or more together in fascicles; the terminal ones racemose and mostly solitary. Pedicels jointed about one-third their length from the base. The expanded perianth about three-fourths of an inch in diameter, orange-yellow; segments narrowly oblong, with closely approximated nerves along the middle. Stamens scarcely half the length of the perianth; filaments roughened with short, obtuse, somewhat retorse teeth; anthers linear-oblong. Ovary obovate, the cells with about 16 anatropous ovules in a double series; style one-third longer than the stamens, filiform; stigma minutely 3-lobed, ciliolate-papillose. Capsule oblong-obovate, obtuse, 3-lobed, thin. Seeds angular, black. E. terniflora differs from our plant in the leaves being 6–7 lines wide, the pedicels jointed in the middle and the more numerous ovules (23–24 in each cell of the ovary.)

SCHŒNOLIRION, Nov. Gen.

Perianthium corollaceum, 6-phyllum, persistens; sepala 3–5-nervia, patentia. Stamina 6, imæ basi sepalorum inserta; filamenta subulata basi complanata; antheræ oblongæ, utrinque bifidæ, introrsae. Ovarium liberum, ovali-globosum, subsessile, 3-loculare; ovula in loculis 2, collateralia, horizontalia, anatropa; stylus filiformis, rectus; stigma minutum, 3-lobum. Capsula globoso-obovata, 3-loba; loculis 1–2-spermis. Semina subglobosa nigra nitida.—Herbæ perennes; rhizomate bulboso-tuberosa; foliis subradicalibus angusto-linearibus subcanaliculatis; scapo gracili; floribus albis in racemis simplicibus vel laxe paniculatis; pedicellis juxta florem articulatis basi bracteatis.

SCHŒNOLIRION MICHAUXII: pedicellis bracteis 2–4-plo longioribus; sepalis ovatis, nervis subdistantibus.—Phalangium croceum, *Michx. Fl.* 1, p. 196. Ornithogalum? croceum, *Ell. Sk.* 1, *p.* 397; *Kunth, Enum.* 4, *p.* 371. O. Texanum, *Scheele in Linnæa, p.* 146. Moist places on the Colorado of Texas, March—April; *Wright.* Also found on the Red River of Louisiana, by Dr. Hale, and in East Florida by *Mr. Buckley* and *Dr. Chapman.* Rhizoma oblong or sometimes elongated, about as thick as the little finger, crowned with a scaly bud or bulb. Leaves 1–1½ foot long, narrowly linear, glabrous, somewhat channelled above, and rounded underneath. Scape 1½–3 feet high, terete, slender, simple, or with a few branches above. Racemes 8–25-flowered, the pedicels 5–8-lines long, somewhat spreading, with short bracts at the base. Perianth, when expanded, 4–5 lines in diameter, spreading, white, the 3 exterior sepals greenish externally along the middle. Stamens a little shorter than the perianth; filaments white. Capsule coriaceous, somewhat truncate, with 3 rounded lobes; cells 1–2-seeded, one or two of them abortive. Seeds globose-obovate, black and shining. Embryo straight in the axis of fleshy albumen. The flowers of this species are yellowish when dry, a circumstance which doubtless gave rise to the specific name of Michaux, but which had best be superseded, as it may lead to error. S. album, *Durand,* differs in its pedicels being much shorter than the subulate bracts; in the oval sepals which are narrowed towards the base, and in the almost confluent nerves. The perianth is also of much more delicate texture than in S. Michauxii, and dries white. This genus was indicated in Durand's account of a collection of California plants made by Mr. H. Pratten and published in the Journal of the Academy of Philadelphia (n. ser. vol. 2.) It is much more nearly related to Ornithogalum than to Phalangium.

SMILACINA STELLATA, *Desf. in Ann. Mus.* 9, *p.* 51. Near the Copper Mines, New Mexico; *Bigelow.* Moist places near Monterey, California, April; *Parry.* The raceme is looser, and the pedicels considerably longer than in the eastern plants.

SMILACINA RACEMOSA, *Desf. l. c.* Mountains on the Mimbres, April—May; *Bigelow, Thurber.* California; *Parry.* The branches of the panicle are shorter and fewer-flowered, both in the California specimens and in those of New Mexico, than in the plant of the Eastern States.

POLYGONATUM BIFLORUM, *Ell. Sk.* 1, *p.* 393? Copper Mines, New Mexico, June; *Bigelow.* (No. 1917, *Wright.*) Whole plant quite smooth. Stem about a foot and a half high. Leaves narrowly oblong, glaucous underneath. Peduncles 2-flowered. Filaments very slightly rough, inserted below the middle of the tube of the perianth.

YUCCA ANGUSTIFOLIA, *Pursh, Fl.* 1, *p.* 227; *Nutt. Gen.* 1, *p.* 218. Sandy hills and plains, New Mexico, Western Texas and Chihuahua, May—August. (No. 910 and 911, *Wright*; No. 850 of Fendler's New Mexican collection.)

Yucca? parviflora (n. sp.): subacaulis; foliis anguste-linearibus canaliculatis rigidis recurvatis margine filamentosis; pedunculis scapiformibus subpaniculatis; bracteis e basi dilatatis promisse acuminatis; pedicellis fasciculatis; sepalis linearibus subconniventibus; stylus filiformibus, stigmate integro truncato. Gravelly hills near the mouth of the Pecos; *Bigelow.* Stony hills west of the Nueces, Texas; *Wright,* (No. 1908). Caudex apparently very short. Leaves 12–18 inches long, 4–5 lines wide, conduplicate when dry, very smooth, acute at the tip, but not pungent; the filaments on the margin 1–2 inches long and about as thick as common sewing-thread. Scape 3–4 feet long, with distant clasping bracts; the upper part racemose and somewhat branching. Pedicels 3–4 together, 6–10 lines long, arising from the axis of a clasping bract, erect, a little thickened upward and articulated close to the flower. Perianth white? the divisions about three-fourths of an inch long, scarcely 2 lines wide, rather obtuse, scarcely united at the base. Stamens 6, shorter than the perianth; anthers oblong; bifid at the base. Ovary oblong, 3-celled; the cells with numerous horizontal ovules; style a little exserted, filiform, triangular and a little enlarged toward the extremity. This differs from all the other species of the genus in its elongated filiform style and narrow sepals. The fruit of Mr. Wright's specimens in Dr. Gray's herbarium is unripe. It is subglobose, and about an inch in diameter. As Mr. Wright likens it to a fig, it is doubtless fleshy.

Yucca puberula, *Haw. in Phil. Mag. March* 1828, *ex Kunth. Enum.* 4, *p.* 272. Y. brevifolia, *A. Schott, MSS.* Valley of the Santa Cruz river, and Sierra del Pajarito, near the monument, Sonora, June; *Schott.* Stems 6–8 feet high. Leaves mostly in a terminal crown, about a foot long and 5–6 lines wide, concave above, a little rounded underneath, of a thick and firm texture, with a few loose threads on the margin, the apex armed with a spine. The persistent retrorsely imbricated vestiges of former leaves give the stem a very rough appearance. Scape 2–3 feet long, paniculate above, pubescent. Bracts at the base of the branches lanceolate, tapering to a long point. Flowers apparently white. Sepals broadly elliptical 1¼ inch long, rather acute. Fruit about 2½ inches long, and 1¼ in diameter, pointed with the base of the styles. "This is the *Sotol* of the Sonorians, but not of the Texans along the Rio Grande. It bears large fleshy fruits which are edible, and called *Datili,* probably on account of their shape."—*Schott.*

Yucca rupicola, *Scheele in Linnæa,* 23, *p.* 143. Y. tortifolia, *Lindh. MSS.* Gravelly hills and plains, western Texas, New Mexico, and Chihuahua, April–May. (No. 688, 689, and 1,909, *Wright.* No. 709, Fasc. IV, *Lindheimer.*) Fruit an inch and a half long, dry or nearly so, often remarkably constricted near the middle.

Yucca baccata (n. sp.): foliis lanceolatis planis crebris margine filamentiferis apice convolutis, spina terminali brevi; floribus campanulatis; fructibus racemosis cernuis ovatis baccatis. Parras, Cohahuila; *Thurber.* High table lands between the Rio Grande and the Gila; *Major Emory.* This is the same species that is noticed in the Botany of Whipple's Report as having been found at Hurrah Creek, New Mexico, by Dr. Bigelow. According to Dr. Bigelow it is a low species, with a subterranean caudex. We have no information as to the length of the scape. The flowers appear to form a racemose panicle. They are larger than in any other species of Yucca here noticed; the sepals being 2½–3 inches long, tapering to each end and 6–7 lines wide in the middle. The fruit is the size of a large fig, with a sweet edible pulp. Near Monterey, California, Dr. Parry collected the leaves of a yucca resembling those of this species, except in being smaller. On the plains of western Texas, near the Limpio, and in the vicinity of Presidio del Norte, Dr. Bigelow found a yucca 10–15 feet high, with leaves almost exactly like those of

Y. baccata, but the fruit is longer, though not greater in diameter, and the pulp is thicker. It may, till better known, be regarded as a variety (*macrocarpa*) of that species. We have from Mr. Thurber the leaves and a portion of the fruit of a yucca which he collected near Parras, in Cohahuila, where it covers the table lands. It is a tree sometimes twenty-five feet or more in height, with several spreading branches. The leaves are about 15 inches long, and from an inch to an inch and a half wide, flat, terminating in a spiny point, and the margin filamentous. The fruit is two or three inches long, and has a thin sweet pulp. The seeds are thick and black. A figure of the plant is given in Bartlett's narrative, vol. 2, p. 491. Our specimens are hardly sufficient for determining whether it is a described species. It may not be distinct from the yucca found by Dr. Bigelow. Mr. Schott, in his notes, states that on the upper Rio Grande he saw a yucca, bearing edible fruits, with a stem 18 inches in diameter. The trunks have been used in Mexico as palisades in the construction of stockades. Besides the above species, there are two or three others in the collections, which I have not been able to determine satisfactorily for want of sufficient materials. One is a yucca found by Mr. Schott on rocks near San Pasqual, southern California. It is the same that is doubtfully referred to Y. aloifolia in the Botany of Whipple's Report, (excluding the synon. and No. 1909, *Wright.*) The caudex is 1–2 feet high, and the scape 2–3 feet. The leaves are 18 inches or more in length, channelled on the upper side, rounded or obtusely angular underneath, and slightly serrulate-scabrous on the margin; the apex convolute and spiniferous. The flowers (as represented in a sketch) are in a spreading panicle. Capsule coriaceous, obovate, and somewhat truncate, 3-lobed, an inch and a quarter long and of nearly the same breadth. Seeds semiorbicular, thin and flat. If it prove to be a distinct species it may be called Y. Whipplei. The late Dr. Gregg found between Parras and Cerralbo a yucca between 20 and 30 feet in height; but his specimens are too imperfect for comparison.

MELANTHACEÆ.

ANTICLEA FREMONTI, *Torr. in Bot. Whippl. Report, p.* 144. Fields around San Diego, California; *Parry.*

XEROPHYLLUM TENAX, *Nutt. Gen.* 1, *p.* 235, *Gray, Melanth. in Ann. Lyc. N. York,* 4, *p.* 129. Helonias tenax, *Pursh, Fl.* 1, *p.* 243, *p.* 9. Dry hills near the seacoast, Monterey, California, May; *Parry.*

SCHŒNOCAULON DRUMMONDII, *Gray, in Bot Beech. p.* 388, *adn.* S. TEXANUM, *Scheele in Linnæa,* 25, *p.* 262. Near Yorktown, on the Lower Rio Grande, Texas, April—October; *Schott.* This species was first discovered by Drummond, and is No. 284 of his third Texan collection. It was afterwards found by Dr. Riddell and Mr. Lindheimer. The filaments are dilated *upward* and not downward, as stated by Scheele l. c.

JUNCACEÆ.

JUNCUS BALTICUS, *Willd. in Berl. Mag.* 1809, *p.* 298, *ex Kunth, Enum.* 3, *p.* 316. Sandy moist places, western Texas, New Mexico, Sonora and California, June; (No. 1920 and 1921, *Wright.*)

JUNCUS DEBILIS, *Gray, Manual, ed* 2, *p.* 480. J. polycephalus, var.? depauperatus, *Torr. Fl. N. York.* 2, *p.* 328. Wet places along the Limpio, July; *Bigelow.* Arroyo de los Janos, Sonora; *Schott.* (No. 1925, *Wright.*)

JUNCUS XIPHIOIDES, *C. A. Mey. in Reliq. Haenk.* 2, *p.* 143, *ex Kunth, Enum.* 3, *p.* 331. Near Monterey, California, May; *Parry.* Very near J. Menziesii β. Californicus, *Hook. & Arn. Bot. Beech, p.* 402.

JUNCUS ARTICULATUS, *Linn.*; *Gray, l. c.* J. lamprocarpus, *Ehrh.* Near the Copper Mines, New Mexico, June; *Bigelow.* Var. CRASSIFOLIUS: foliis crassis compressis vix articulatis. Sonora; *Schott.* Var. MULTIFLORUS: capitulis paucis 20–30-floris. Fronteras, Sonora; *Thurber.*

JUNCUS NODOSUS, *Linn.; Gray, l. c.* Laredo, on the Lower Rio Grande, June; *Schott.* Var. MEGACEPHALUS, *Torr. Fl. N. York*, 2, *p.* 327. San Elceario on the middle Rio Grande; *Bigelow.* Along the Gila, Sonora; *Thurber, Schott.*

JUNCUS TENUIS, *Willd. sp.* 2, *p.* 214; *Torr. Fl. N. York*, 2, *p.* 327. Hills at the Copper Mines, New Mexico; *Thurber.*

JUNCUS MARGINATUS, *Rostk. Junc. p.* 38, *t.* 2, *f.* 3. Western Texas; *Wright.* (No. 1923 in part.

JUNCUS LONGISTYLIS (n. sp.): culmo erecto simplici compresso foliato; foliis planis gramineis; capitulis paucis 4–6-floris in panicula sub-simplici dispositis; sepalis lanceolatis mucronatis capsula obovato-oblongo obtusa mucronata paullo longioribus; seminibus oblongis utrinque acutis ecaudatis. Near the Copper Mines, New Mexico, June; *Bigelow.* (No. 1924, *Wright.*) Culms from a rather stout root-stock, 12–18 inches high, slender, distinctly compressed. Leaves flaccid, 1–1½ line wide, obscurely nerved; the radical ones 6–8 inches long, those of the culm (2–3 in number) shorter. Heads 4–8 in a contracted or oblong panicle, the bracts at the base ovate, scarious, about as long as the sepals. Stamens 6. Style more than half as long as the ovary. Capsule usually about one-fifth shorter than the sepals. A very distinct species. J. marginatus, to which it is nearest related, differs in the usually much more numerous heads, triandrous flowers, short style, obtuse inner sepals and subglobose capsule. No. 857 of Fendler's New Mexican collection seems to be a variety of this species, with only two or three closely approximated heads.

JUNCUS BUFONIUS, *Linn. Sp. p.* 466; *Kunth, Enum.* 3, *p.* 353. Moist places, Sonora and California; *Thurber.*

LUZULA CAMPESTRIS, *DC.; Torr. Bot. Whippl. Rep. p.* 143. Pine woods near Monterey, California, May; *Parry.*

PONTEDERIACEÆ.

HETERANTHERA LIMOSA, *Vahl, Enum.* 2, *p.* 44; *Pursh, Fl.* 1, *p.* 32; *Kunth, Enum.* 4, *p.* 122. Wet places along the Limpio, and at the Copper Mines; also in Sonora; flowering through the summer and autumn. (No. 1927, *Wright.*)

SCHOLLERA GRAMINIFOLIA, *Willd.* Heteranthera graminea, *Vahl, l. c.; Torr. Fl. N. York*, 2, *p.* 313, *t.* 133. Near Matamoras, in Tamaulipas, on the lower Rio Grande, May; *Schott.* The specimens appear to have grown in very shallow water, or on muddy ground. The stems are scarcely an inch long, and the leaves are only about twice that length.

HYDROCHARIDACEÆ.

LIMNOBIUM SPONGIA, *Rich. in Mem. Instit.* 2, *p.* 66, *t.* 8. Hydrocharis spongiosa, *Bosc.* Near San Antonio, Texas; *Schott.*

COMMELYNACEÆ.

COMMELYNA VIRGINICA, *Linn. Sp. p.* 61; *Gray, Man. ed.* 2, *p.* 486. C. angustifolia *Michx. Fl.* 1, *p.* 24. Moist thickets and borders of rivers. Western Texas, New Mexico, and Chihuahua; flowering throughout the season.

β.? LATIFOLIA: foliis ovatis tenuibus basi obtusis summis cordatis glabris, vaginis ore ciliatis; spatha subtriflora brevi rostrata basi subturbinata.—Shady alluvions of the lower Rio Grande, September; *Schott.* Stem branching, (only the upper part seen,) glabrous. Leaves very thin, 2–3 inches long, 1–1½ inch wide, acute. Flowers only 2 and sometimes a rudiment in one spatha. Sepals and petals nearly as in C. Virginica, but the latter, Mr. Schott says, are white. We need more specimens, in order to determine whether the plant is a distinct species.

COMMELYNA LINEARIS, (*Benth. Pl. Hartw. p.* 27, var. LONGISPATHA:) caule erecto-subramoso; foliis lanceolato-linearibus complicatis, margine scabro; spatha terminali complicata longissime rostrato-attenuata; pedunculis geminis, incluso 8–10-floro, exserto 1–2-floro; petalo impari sessili lateralibus paullo breviore.—Near the Copper Mines, New Mexico, August; *Bigelow.* (No. 700, (in part) 1923 and 1930, *Wright.* No. 864, *Fendler.*) Stem 1–2 feet high, with short axillary branches. Leaves 4–6 inches long, and about a quarter of an inch wide, tapering at each end, slightly pubescent; the sheaths a little swollen, fringed at the orifice. Spatha pedunculate, cordate, not at all turbinate at the base; the narrow tapering somewhat recurved point 1–2 inches long; peduncles of the spatha hispidly pubescent, the terminal one much exserted. Exserted flowering peduncle about an inch long. Exterior sepal ovate, acute, carinate; the two lateral sepals united above the middle, obtuse. Petals bright blue, the lateral ones unguiculate, the odd one about one-third smaller and sessile. Stamens 6; filaments all glabrous; 3 of the anthers abortive and cruciform; the others fertile, oblong, one of them larger and curved. Style long and slender, a little incurved toward the summit. Capsule oblong, one of the cells usually abortive, the other cells 2-seeded. Seeds oblong or roundish, corrugated. A well characterized species, remarkable for the long attenuated apex of the spatha. I first received it from Lieutenant Abert, of the United States army, who collected it on the Pecos river.

TRADESCANTIA VIRGINICA, *Linn. Sp. p.* 412; *Kunth, Enum.* 4, *p.* 81. Valley of the Limpio, July; *Bigelow.* A glabrous narrow-leaved form. No. 1928 and 1929, *Wright*, are other varieties of this polymorphous species.

TRADESCANTIA MICRANTHA (n. sp.): caule subramoso repente linea alterne pubescente; foliis ovatis subamplexicaulibus acutis glabris margine serrulatis, vaginis brevibus ore ciliatis; umbella pauciflora sessili; sepalis obtusiusculis ad carinam hispidulis.—Lower Rio Grande, towards the mouth, October; *Schott.* Stems flaccid, smooth, except the narrow alternate line of pubescence. Leaves about three-fourths of an inch long, and one-third of an inch wide, the two uppermost connate. Umbels only terminal in our specimens. Pedicels 3–8 lines long, nearly smooth. Flowers scarcely one-third of an inch in diameter. Sepals ovate-oblong, equal. Petals pale blue, one-third longer than the sepals, obovate-orbicular. Stamens 6; filaments all bearded; anthers all similar and fertile; the cells separated by a broad connective. Ovary obovate; style long and slender; stigma peltate-capitate. This species has the aspect of Callisia repens.

TRADESCANTIA BIANDRA (n. sp.): caule subramoso erecto glabro, superne nudo; foliis remotis lanceolatis glabris margine ciliolato-scabris, floralibus brevibus acuminatis, vaginis ore nudis; umbella sessili multiflora; pedicellis villosissimis; filamentis imberbibus.—Mountains and moist, rocky places, Puerto de Paysano, September; *Bigelow.* (No. 700, *Wright.*) Stems 12–18 inches high, moderately branched above. Leaves 3–5 inches long, and 6–8 lines wide, acute, scarcely narrowed at the base; the sheaths wide and short. Floral leaves connate and spreading horizontally, ovate, acuminate, cordate at the base. Umbel 20-40-flowered; the pedicel densely clothed with long white hairs. Sepals oblong, rather obtuse, smooth. Petals roundish-obovate, a little narrowed at the base, deep rose-color. Filaments all smooth, two-thirds the length of the petals; anther-cells separated by a wide connective. Style filiform; stigma capitate-peltate. Cells of the capsule 2-seeded.

Var. BREVIFOLIA: caule prostrato; foliis ovatis approximatis crassiusculis glaucis, vaginis ore ciliatis.—Mountains near the mouth of the Pecos; *Bigelow.* The general appearance of this plant is certainly very unlike that of T. leiandra, but the pedicels and flowers are so similar that I hesitate to separate it as a distinct species.

TRADESCANTIA ANOMALA (n. sp.): caulibus pluribus erectis; foliis inferioribus angusto-lanceolatis basi attenuatis ciliatisque, superioribus ovato-lanceolatis subamplexicaulibus, supremo (spatha?) cordato; racemo terminali paucifloro brevipedunculato; pedicellis brevibus glabris; sepalis ovato-oblongis acutiusculis carinatis; petalis valde inequalibus, lateralibus orbiculari-obovatis, impari rhomboideo parvula; staminibus 6; antheris difformibus; filamentis 3 superne, 2 basi barbatis, una imberbe. Shady woods on the Blanco, Comale, and other rivers, Texas; *Wright,* (No. 699.) San Antonio, Texas; *Thurber.* I have long had Texan specimens from Mr. Wright, from near Austin, &c. The species is intermediate between Tradescantia and Commelyna; resembling the latter in the unequal petals and difformed stamens as well as in the terminal leaf or bract (which is like a spatha laid open); and the former in the 6 fertile stamens with bearded filaments. The plant seems to be an annual, and is a foot or 15 inches high. Lower leaves 4–6 inches long, and half an inch wide in the middle, the tapering base fringed with a few long hairs, otherwise smooth; upper leaves much shorter and rounded at the base. Peduncle 4–6 lines long. Raceme about 5-flowered; pedicels short, with ovate bracteoles at the base. Sepals glabrous, green. The 2 lateral petals bright blue, nearly twice as long as the sepals, odd one rhombic, white, less than one fourth as large as the others. The 3 stamens that are opposite the petals shorter than the others and furnished with oblong anthers; filament of the one opposite the small odd petal beardless, of the 2 lateral ones bearded with purple hairs near the base. The other three stamens have smaller roundish similar anthers; the filament of the middle one winged on each side, from the summit to nearly the base, with a membrane which is fringed with yellow hairs; the other two filaments are bearded only near the summit. Ovary ovate, 2-celled, (one of the cells abortive,) with 2 superimposed ovules in each cell; style long, slender, and somewhat curved above; stigma capitate. Capsule oblong, cells 2-seeded. Seeds as in the rest of the genus.

TRADESCANTIA RHODANTHA (n. sp.): caule erecto simplici glabro; foliis linearibus complicato-falcatis utrinque glabris margine scabriusculis, vaginis ore imberbibus; umbellis terminalibus longe-pedunculatis solitariis compositis 3–4-radiatis; umbellulis 3–4-floris; pedicellis sepala exterioreque (antica?) vix hispidulis; filamentis omnibus barbatis; antheris conformibus. Corallitas, Chihuahua, August; *Thurber.* Root fasciculate. Stem 12–15 inches high, slender. Leaves about 3, the sides folded together. Peduncle 4–6 inches long. In the axil of the upper leaf there is second small umbel. Primary rays of the umbel 1–1½ inch long; pedicels of the buds short and nodding; of the flowers 6–10 lines long. Sepals ovate-oblong, rather obtuse. Petals bright rose-color, orbicular-ovate, about 4 lines long. Stamens half the length of the petals; filaments bearded with white hairs; cells of the anthers reniform, separated by a broad connective. Style filiform; stigma peltate-capitate. This species resembles T. rosea, but differs in the smooth sheaths, compound umbel, etc. No. 701 of Mr. Wright's Texan collection (1849) seems to be a dwarf state of T. rosea, but our specimens are too imperfect for satisfactory comparison.

CYPERACEAE.

Cyperus diandrus, *Torr. Cat. Pl. N. York, p.* 90, *& Cyp. p.* 251. Western Texas; *Wright,* (No. 1749.)

Cyperus flavicomus, *Michx. Fl.* 1, *p.* 27; *Torr. l. c. p.* 253. Sonora, Mexico; *Thurber.* (No. 1965, *Wright.*) Our specimens are smaller than the usual form of this species, and the umbel is 2–4-rayed; but in other respects there is no essential difference.

Cyperus microdontus, *Torr. p.* 255. C. Gatesii, *Torr. l. c.* Western Texas; *Wright.* A comparison of specimens from numerous localities shows the necessity of uniting these two species.

Cyperus articulatus, *Linn.; Torr. l. c. p.* 256. Western Texas; *Wright.*

Cyperus lateriflorus (n. sp.): umbella capitato-contracta quasi laterali; involucro diphyllo, foliolis valde inequalibus, uno longissimo erecto culmum desinente; spiculis confertis linearibus 12–20-floris; squamis parum remotis suborbiculari-ovatis obtusissimis (ferrugineis) obscure trinerviis; floribus diandris; achenio obovato triquetro pallido scabriusculo nitidulo squama subæquali; stylo trifido. Along mountain torrents, east of Santa Cruz, Sonora; *Wright,* (No. 1950.) Annual. Culms cæspitose, about three inches high, triangular, slightly rough on the angles. Leaves shorter than the culm, rough on the margin. Involucre of 2 very unequal leaves; one of the leaves nearly as long as the culm, of which it appears to be a continuation, the other scarcely one fourth as long. Umbel somewhat capitate and apparently lateral, sometimes with a single short ray. Spikelets 2–3 lines long. Scales light brown on the sides with a pale narrow margin and keel. Rachis very narrow and zigzag, slightly margined. Allied to C. fuscus of Europe.

Cyperus Michauxianus, *Schultes, Mant.* 2, *p.* 123; *Torr. Cyp. p.* 259. Wet places, western Texas and New Mexico, westward to the Colorado. No. 1946, Wright, is a dwarf variety. C. speciosus, *Vahl,* or at least of *Torr. Cyp.*, of which we have Californian specimens collected by Rev. A. Fitch, is, perhaps, only a luxuriant form of this species, in which the partial umbels are furnished with conspicuous involucels.

Cyperus tetragonus, *Ell. Sk.* 1, *p.* 71; *Torr. Cyp. p.* 261. Santa Cruz, Sonora; *Thurber.* Since this plant was noticed in the Monograph of North American Cyperaceæ, I have seen the original specimens of Elliott, and have also received it from east Florida, Louisiana, and Texas. The umbel consists of 4–10 somewhat spreading rays, each bearing a narrowly oblong spike an inch or more in length. The spikes are either simple or they produce 1–3 smaller ones at the base. Spikelets very numerous, obtuse and somewhat quadrangular, crowded on the rachis and spreading horizontally, (or the lower ones reflexed,) about 2 lines long, usually perfecting 2 or 3 achenia. Scales oblong, rather obtuse, light brown on the sides, with a narrow stripe along the obtuse keel. Stamens 3. Style deeply 3-cleft. Achenium oblong, triangular, dull, embraced by the broad membranaceous margins of the rachilla, which at length separate and appear like 2 inner scales, in which character it accords with the subgenus Papyrus. This species is allied to C. ligularis, *Linn.*

CYPERUS DISSITIFLORUS, *Torr. Cyp. p.* 266. Western Texas; *Wright.* Resembles the last, but is a much smaller plant, with short rays and spikes; the spikelets acute, with narrower scales, etc.

CYPERUS REPENS, *Ell. Sk.* 1, *p.* 69; *Tor. Cyp. p.* 264. C. phymatodes, *Muhl. Gram. p.* 23. Hills near the Copper Mines, New Mexico, and dry ravines on the Limpia, western Texas; *Bigelow.* Sandy river-banks, San Luis Rey, California; *Parry.* (No. 1948, *Wright.*)

CYPERUS SETIGERUS, *Torr. & Hook. in Torr. Cyp. p.* 434. Ravines near Eagle Pass, on the Rio Grande; *Bigelow.* Western Texas; *Wright.*

CYPERUS LUTESCENS, *Torr. & Hook. l. c.* Western Texas; *Wright,* (No. 705.) Perhaps too near the last species.

CYPERUS BALDWINII, *Torr. Cyp. p.* 70. Dry plains between the Pecos and Devil's river; *Bigelow.*

CYPERUS TRACHYNOTUS (n. sp.): culmo valido foliisque glabro obtuse trigono; umbella simplici 3–6-radiata, radiis valde inequalibus; involucro 3–4-phyllo longissimo; spicis subglobosis polystachyis laxiusculis, spiculis lanceolatis compressis 10–14-floris; squamis parum remotis ovatis acuminatis apice subrecurvatis mucronatis, carina superne denticulato-spinulosa; stamina 3; acheniis triquetris basi attenuatis (nigris) squama duplo longioribus. Ravines near the mouth of the Pecos and on Devil's river; *Bigelow, Schott.* (Nos. 704 and 1943, *Wright.*) I have this plant from Key West. It is a well marked species, and does not appear to have been hitherto described.

CYPERUS FILICULMIS, *Vahl, Enum.* 2, *p.* 328; *Torr. Cyp. p.* 267. Western Texas; *Wright.*

CYPERUS OVULARIS, *Torr. Cyp. p.* 278. Mariscus ovularis, *Vahl, Enum.* 2, *p.* 374. Western Texas; *Wright.*

CYPERUS HASPAN, *Linn. Sp. p.* 66; *Kunth, Enum.* 2, *p.* 34. C. gracilis, *Muhl. Gram. p.* 18. C. leptos, *Schultes, Mant.* 2, *p.* 105; *Torr. Cyp. p.* 273. Western Texas; *Wright.*

CYPERUS DRUMMONDII, *Torr. & Hook. in Torr. Cyp. p.* 437. Leone, western Texas; *Bigelow, Wright.* Differs from Drummond's plant, in the somewhat compound umbel, longer rays and larger spikelets with the scales less closely set. We have specimens also from Louisiana and Florida, in which the umbels are compound, but the spikelets are smaller, like those of the original plant.

CYPERUS VIRENS, *Michx. Fl.* 1, *p.* 28; *Torr. Cyp. p.* 275. Moist ravines, western Texas and New Mexico, near the Rio Grande; *Bigelow.*

CYPERUS ARISTATUS, *Rottb; Kunth, Enum.* 2, *p.* 23. C. inflexus, *Muhl. Gram. p.* 16; *Torr. Cyp. p.* 274. Western Texas to California. (Nos. 1951 and 1955, *Wright.*) A widely-spread species, including perhaps most of the Cyperi belonging to the section *Aristati* of Kunth, so far as we can judge from the characters.

CYPERUS SCHWEINITZII, *Torr. Cyp. p.* 276. C. Houghtonii, *Torr l. c.* Hills near the Copper Mines of New Mexico, and wet places, Rock Creek; *Bigelow.* (Nos. 703, 1944, and 1945, *Wright.*) Our numerous specimens show a gradual transition from C. Houghtonii to C. Schweinitzii.

FUIRENA SQUARROSA, *Michx.* Var. ARISTULATA, *Torr. Cyp. p.* 291. Wet places, Leon Springs, Rio Coleto and other places in western Texas.

Eleocharis equisetoides, *Torr. Cyp. p.* 296. E. Elliotti, *Dietr. Spec.* 2, *p.* 82, *ex Kunth.* Scirpus equisetoides, *Ell. Sk.* 1, *p.* 79. In water, borders of the San Felipe. Near the Rio Grande, October; *Bigelow.* The nodes of the culm, especially on the upper part, are much more closely approximated than usual.

Eleocharis cellulosa, *Torr. Cyp. p.* 298. Boggy banks of the Royo Zaquete, September; *Schott.* Rio Colezo, Texas; *Thurber.* Rutenville in the same State; *Wright.* We have specimens also from Key West, collected by Mr. Blodgett.

Eleocharis palustris, *R. Brown, Prodr. p.* 224: *Torr. Cyp. p.* 299. Alluvial soils, in overflowed places, from the Rio Grande to California. A variety with spikes nearly an inch long, and with only rudimentary bristles at the base of the nutlets, was found by Dr. Bigelow near San Elceario, on the Rio Grande. (Nos. 710, 712, 1934, 1957, and 1960, *Wright.*)

Eleocharis obtusa, *Schultes, Mant.* 2, *p.* 89; *Torr. Cyp. p.* 303. Western Texas; *Wright.*

Eleocharis capitata, *R. Brown, Prodr. p.* 225; *Torr. Cyp. p.* 305. On the Rio Coleto, Texas; *Thurber.* (Nos. 1932 and 1933, *Wright.*)

Eleocharis rostellata, *Torr. Fl. N. York,* 2, *p.* 347. Scirpus rostellatus, *Torr. Cyp. p.* 318. Pedro, Pinta, etc. Santa Rita del Cobra, New Mexico; *Bigelow.* San Bernardino, Sonora; *Thurber.* (Nos. 1931, 1934, and 1956, *Wright.*)

Eleocharis tenuis, *Schultes, var. β. Torr. Cyp. p.* 310. Western Texas; *Wright,* (No. 713.) In old spikes the scales are deeply bifid, and the divisions acute. The nutlets are pyriform, of a brownish yellow color, very obscurely triangular, with three slightly elevated lines at the angles. The bristles are only rudimentary.

Eleocharis arenicola, *Torr. in Engelm. & Gray, Pl. Lindh. p.* 30. Western Texas; *Wright,* (No. 1958 and 1959.) The plant is much taller (12–15 inches) than the original specimens, and the bristles are barely as long as the nutlets; but in other respects there is no difference.

Eleocharis acicularis, *R. Brown, Prodr.* 1, *p.* 224; *Torr. Cyp. p.* 308. Western Texas to California. Wright's No. 1937 is a small form, growing on wet ground.

Scirpus Olneyi, *Gray, in Engelm. & Gray, Pl. Lindh. p.* 30, (*adn.*) & *Man. ed.* 2, *p.* 499. Copper Mines, New Mexico, *Bigelow.* San Bernardino, Sonora; *Thurber.* (No. 1964, *Wright.*) The style is sometimes 3, and even 4-cleft.

Scirpus pungens, *Vahl, Enum.* 2, *p.* 255; *Gray, Man. l. c.* Frontera, Texas; *Parry.* (No. 1941 and 1963, *Wright.*) The spikes are oblong or sometimes almost cylindrical, and the style is more frequently 3- than 2-cleft.

Scirpus lacustris, *Linn.; Torr. Cyp. p.* 321. S. validus, *Vahl, Enum.* 2, *p.* 268. S. acutus, *Muhl. Gram. p.* 33. On the Rio Grande and its tributaries, from El Paso to San José, and westward to California. On the valley of the Sacramento, Dr. Hulse, there are thousands of acres covered with this plant, and of the height of 9 or 10 feet. It is called *Tulé* or Giant rush. It varies much in the size of the panicle. The perigynous bristles are mostly narrow and retrorsely hispid, but sometimes broad and retrorsely or horizontally plumose. These characters are not constant, there being intermediate forms. Bentham refers No. 2021 of Hartweg's Californian collection to S. riparius, *Presl,* which Kunth regards as identical with Elytrospermum Californicum, *C. A. Mey.;* which again is the same as the earlier Malacochete of Nees. In our specimen of Hartweg's plant there are four plumose bristles, while Meyer states that there are but two in his Elytrospermum. The number of these organs is, however, by no means constant in this genus, and in every other respect Elytrospermum resembles the form of Sc. lacustris with broad plumose setæ. Scirpus lacustris of the old world is said to differ from ours in having a 3-cleft style, but in our authentic European specimens the style is 2-cleft.

SCIRPUS MARITIMUS, *Linn.; Torr. Cyp. p.* 323. On the Rio Grande, and westward along the Gila to the Colorado. (No. 1942 and 1962, *Wright.*) The long creeping rhizoma produces one or more ovate farinaceous tubers about an inch in length. They are white inside, and covered with dark brown scales which terminate in long filaments.

FIMBRISTYLIS SPADICEA, *Vahl, Enum.* 2, *p.* 294; *Torr. Cyp. p.* 346. F. cylindrica, *Vahl, l. c.* Leon Springs, western Texas; *Bigelow.*

ISOLEPIS CAPILLARIS, *Roem. & Schultes, Syst.* 2, *p.* 118; *Torr. Cyp. p.* 350. Fimbristylis capillaris, *Gray, Man. ed.* 2, *p.* 503. Oak woods on the Colorado, Texas; *Wright,* (No. 1936 in part.) Var. culmo 1–2-stachyo. Base of the Limpio mountains, and near the Copper Mines of New Mexico; *Bigelow.* (No. 1936, in part, *Wright.*) Culms 3–6 inches high, often bearing only a single spike, and very rarely more than two; the primary one solitary and the other on a ray 2–3 lines long. Involucre of two very unequal leaves, one of which is longer than the ray, the other mostly shorter than the sessile spike. Scales and nutlets as in the ordinary form of the plant.

DICHROMENA LEUCOCEPHALA, *Michx. Fl.* 1, *p.* 37; *Torr. Cyp. p.* 357. Near the Guadalupe river, above Victoria, Texas; *Schott.* (No. 716, *Wright.*)

HEMICARPHA SUBSQUARROSA, *Nees, Cyp. in Endl. & Mart. Fl. Bras. p.* 61, *t.* 4, *f.* 1; *Torr. Fl. New York,* 2, *p.* 362. Scirpus subsquarrosus, *Muhl. Gram. p.* 39. Isolepis subsquarrosa, *Schrad.; Torr. Cyp. p.* 51. Hills near the Copper Mines of New Mexico. (No. 715 and 1936, *Wright.*)

CLADIUM EFFUSUM, *Torr. Cyp. p.* 374. Schœnus effusus, *Swartz; Muhl. Gram. p.* 13. Wet places in elevated valleys on the Limpio; *Bigelow.* Western Texas; *Wright.*

GENUS CAREX.

BY PROFESSOR C. DEWEY.

CAREX HOODII, *Boott, in Hook. Fl. Bor.-Amer.* 2, *p.* 211, *t.* 211. Copper Mines, New Mexico; *Bigelow.*

CAREX DOUGLASII, *Boott, l. c. t.* 214. Copper Mines and other parts, New Mexico; *Bigelow.*

CAREX MARCIDA, *Boott, l. c. t.* 213. River banks near San Luis Rey, California, March; *Parry.* San Bernardino, Sonora, and along the Gila, June; *Thurber.* Camp Tezotat, Sonora; *Thurber, Schott.*

CAREX SICCATA, *Dewey in Sill. Journ.* 29, *p.* 278, *t. F. f.* 18, *&* 14, *p.* 353. C. pallida, *Meyer.* Chihuahua; *Parry.*

CAREX FESTIVA, *Dewey in Sill. Jour.* 29, *p.* 351, *t. W. f.* 71. Monterey, California, April; *Parry.*

CAREX CEPHALOPHORA, *Willd. Sp.* 4, *p.* 220. In woods, western Texas; *Wright.*

CAREX HOOKERIANA, *Dewey in Sill. Jour.* 29, *p.* 248, *t. X. f.* 75. Copper Mines and Rio Mimbres, New Mexico; *Bigelow.* The specimens are numerous, large and small forms, and are well characterized.

CAREX LIDDONI, *Boott, in Hook. Fl. Bor.-Amer.* 2, *p.* 214, *t.* 215. Copper Mines, May; *Thurber.*

CAREX MONTICOLA (Dewey): spicis distinctis erectis breviusculis oblongis; staminifera terminali solitaria inferne tereti brevi-bracteata cum squamis oblongis obtusiusculis dorso excepto castaneis; pistiliferis 2-sublaxifloris, superiore sessili illi contigua, infima interdum sub-remota vaginata exserte pedunculata; perigyniis 2- vel raro 3-stigmaticis lato-ovatis oblongis convexo-concavis acutiusculis vix rostratis ore integris vel subbifidis subvillosis nervosis, squama lato-ovata acuta vel inferiore mucronata paulo longioribus; foliis vaginatis culmum superantibus.—Mountains east of San Diego, California, *Parry.* Culm 8-10 inches high, scabrous above, leafy; leaves flat, rough on the edges, sheathed to the base and longer than the culm; the lower scales of the perigynium sometimes mucronate and equal to it; the achenium ovate or obovate and convex above. In species where the stigmas are commonly two but sometimes three, the achenium has the lenticular shape belonging to two stigmas, probably the other stigma being abortive.

CAREX RECTA, *Boott; Hook. Fl. Bor.-Amer.* 2, *p.* 220, *t.* 222, *no.* 95. Rio Mimbres, New Mexico, May; *Thurber.*

CAREX STRICTIOR, *Dew.* C. stricta, var. strictior, *Carey in Gray's Man.* Rio Mimbres, New Mexico, May; *Thurber.*

CAREX STRICTA, *Lam.* Rio Mimbres, New Mexico, June; *Bigelow.*

CAREX EMORYI (*Dewey*): spicis staminiferis terminalibus ternis oblongis cylindraceis erectis, superiore longiore brevi-pedunculata, inferioribus sessilibus brevioribus illi contiguis brevi-bracteatis, densifloris, omnibus cum squamis oblongis obovatis obtusis castaneis; spicis pistilliferis 4 longo-cylindraceis densifloris sessilibus longo-foliaceo bracteatis, superioribus apice staminiferis, infima omnino fertili et subremota; perigyniis distigmaticis ellipticis basi teretibus apiculatis vel brevi-rostratis ore integris squama ovata oblonga subacuta duplo longioribus; culmo superne scabro; bracteis evaginatis margine scabris; planta pallido-viridi vel glauca.—The staminate spikes are rather short and contiguous, the upper longest and sub-clubform; pistillate spike 4, rather long, 1½–2 inches, cylindric, erect, sessile, staminate at the apex and bracteate, the lowest wholly fertile and slightly sheathed and nearly sessile; perigynium narrow-elliptic, tapering below, flattish, obovate and apiculate or short and round, rostrate, at the orifice entire, stigmas two; pistillate scale ovate, oblong, acutish, half as long as the fruit; culm triquetrous, scabrous above; bracts scabrous on the margin, long and leafy and surpassing the culm, whole plant pale green or glaucous. On the upper Rio Grande; *Bigelow.*

CAREX DECIDUA (*Boott. in Linn. Trans.* 20, *p.* 119): spicis 3–6 erectis cylindraceis gracilibus atro-purpureis, suprema staminifera brevi-pedunculata clavæformi omnino stamina habente vel sæpe basi aut interdum medio pistillifera, cum squamis oblongis obovatis obtusis dorso albinervosis; pistilliferis 1–5, interdum 1–3, sessilibus bracteatis, superioribus 1–3 brevibus parvis contiguis apice staminiferis, inferioribus 2–3 longioribus subremotis foliaceo-bracteatis; perigyniis distigmaticis oblongo-ovatis vel partim obovatis rostellatis inferne teretibus nervatis ore integris, squama oblonga obtusa dorso pallida subduplo longioribus. Banks of rivers, Santa Barbara, California; *Parry.*—Culm 1–1½ foot high, triquetrous and very rough on the edges above, leafy towards the root, and sheathed, rather slender; staminate spike single, about 1½ inch long and rather thick, short-pedunculate, often pistillate at the base, and sometimes in the middle, or both, the rest destitute of pistils; pistillate spikes erect, sessile, rough-bracteate, varying in number, sometimes 1–3 short and approximate, and near the staminate having stamens at the apex with two or three and longer spikes below not androgynous, sometimes only two or three pistillate spikes, of which the upper is short and the lower longer and more remote; stigmas two; perigynium ovate-oblong or obovate, very short rostrate, entire at the orifice, nerved and lens-like, scarcely stiped; pistillate scale oblong, obtuse, pale on the keel, and near twice as long as the fruit.

CAREX BARBARÆ (*Dewey*): spicis staminiferis terminalibus 2 raro 3 erectis cylindraceis, suprema longa pedunculata, inferiore breviore illi contigua, infima sub-elongata; pistilliferis 3 longo-cylindraceis, 2–4-uncialibus gracilibus, superiore apice staminifera brevi-bracteata erecta, inferioribus longioribus subremotis subrecurvis basi laxifloris brevi-vaginatis foliaceo-bracteatis, omnibus nigro-purpureis; perigyniis distigmaticis oblongis obovatis apiculatis ore integris, squama oblongo obovata dorso pallida mucronata brevioribus; culmo erecto glauco longe-foliato vaginatoque. Banks of streams, Santa Barbara, California; *Parry.*—Culm 16–20 inches high, erect, with long leaves towards the base and long leafy bracts above, glaucous; spikes 3–6, cylindric, slender, blackish-purple; staminate terminal 1–3, commonly 2, the upper nearly two inches long, pedunculate, the lower sessile, contiguous and shorter, the third longer than the last and more remote; pistillate 3, long-cylindric, 2–4 inches long, slender; the upper staminate at the apex, short-bracteate, erect; the lower longer, subremote, subrecurved, loose-flowered at the base and short-sheathed; perigynium oblong-obovate, short-rostrate, entire at the orifice, stigmas 2, pistillate scale oblong-obovate, on the back pale, and the nerve extended into a mucronate point, making the end of the scale sometimes emarginate. The locality gives the name of the species.

CAREX SCHOTTII (*Dew.*): spicis staminiferis terminalibus 3–5 erectis nigro-rubris approximatis prope geminatis cylindraceis, superiore longa 3-unciali medio inflata, inferioribus brevioribus sessilibus contiguis vel infima remotiore et interdum geminata; pistilliferis 3 raro 4 perlongo-cylindraceis gracillimis 6–8 uncialibus perlaxifloris inæqualiter pedunculatis, inferioribus longe pedunculatis folioso-bracteatis basi vaginatis vix fructiferis vel abortivis, cum squamis oblongis arctis obovatis vix acutis; perigynio carente vel nimis immaturo; culmis superne scabris subprostratis? cum foliis bracteisque viridi glaucis. Banks of rivers, Santa Barbara, California; *Parry.*—This species has very variable spikes and form, as the description shows; spikes 6–8, cylindric; sometimes staminate 5 and pistillate 3, sometimes 4 and 3, sometimes 3 and 3, or again 3 and 4, most of which are long, and some very long; the staminate upper 3 are approximate, so as to be almost geminate, the highest 3 inches long and ventricose in the middle, and the lower a little remote and shorter, often one lower and a little remote and rather long, and on one specimen geminate and one quite short; the staminate scale oblong, obovate, dark red and pale on the back; pistillate spikes 3, rarely 4, very long and slender, 4–8 inches, very loose-flowered, unequally pedunculate, the lowest long pedunculate and long vaginate, all leafy bracteate, with scarcely the rudiment of fruit, or abortive, and with a narrow, oblong, obovate scale scarcely acute; perigynium wanting, or too immature; culm triquetrous above and scabrous, with glaucous leaves and bracts. This species has some affinity to C. Darwinii, *Boott. in Trans. Linn.* 20, *p.* 120, but the numerous differences far separate the two. There may have been some crushing of the culms to account for their prostrate appearance, without which, at least, the pistillate spikes must have been long-retrocurved as in C. pendula, *Gooden.*

CAREX PHYLLOSTACHYS, *Meyer*, *Trans. Acad. St. Petersb.* Collected in California by Dr.

Parry. Clearly distinct from Carex Geyeri, *Boott.*, and closely related to Carex Wildenowii, *Schk.*

CAREX UMBELLATA, *Schk. Car. II, p.* 75, *t. Ww w. fig.* 171, var. VICINA, *Dew. in Sill. Journ.* 9, *p.* 31, *&* 11, *p.* 316, *t. D. f.* 13. Often with three pistillate spikes near the staminate spike, as well as the radical spikes, on the same tuft. Woods on the Colorado and Blanco rivers, Texas; *Wright.* In both these localities, the plant described and drawn by *Schk.*, and the variety also abound together, the latter most common.

CAREX THURBERI (*Dewey*): spicis 4 oblongo-cylindraceis pedunculatis foliaceo-bracteatis; spica staminifera terminali solitaria sublonga cum squamis oblongis obtusis mucronatis fulvis; pistilliferis 3 subcrassis vix nutantibus densifloris sub-approximatis, superioribus vix vaginatis, infima cum pedunculo sublongiore vaginato exserto; perigyniis tristigmaticis ovato oblongis multo-nervosis subventricosis brevi-conico-rostratis bidentatis squama brevi-oblonga obtusa dorso trinervata scabro-aristata longioribus vel basi spicarum brevioribus; culmis et foliis margine scabris.—Mabibi, Sonora, June; *Thurber.*—Culm two feet high, erect, scabrous above and smooth below the spikes, leafy towards the base; upper leaf vaginate and long as culm, and with the leafy bracts rough on the edges; staminate spike single, erect, long, and bracteate; pistillate spikes three, oblong, cylindric, thickish, densely flowered, pedunculate, the lowest vaginate, with an exsert peduncle; stigmas three; perigynium ovate or oblong, many-nerved, tapering into a shortish beak, bidentate, some inflated or ventricose; pistillate scale short, oblong, obtuse, scabrous cuspidate, shorter than the fruit, except at the base of the spikes it is longer. This differs much from C. hystricina, *Willd.*, to which it is related.

CAREX HYSTRICINA, *Willd. Spec. Plant.* 4, *p.* 232. On the banks of the Limpio, Texas; and at Santa Rita del Cobre, New Mexico; *Bigelow.*

CAREX WRIGHTII (*Dewey*): spicis staminiferis 2; raro 3; oblongo cylindraceis erectis, terminali longiore brevi-pedunculata, secunda brevi illa contigua sessili raro remotiuscula, tertia remotiore, omnibus bracteatis cum squama oblonga acuta castanea inferne aristata; spicis pistilliferis 2–3 oblongo cylindraceis gracilibus sublaxifloris remotis exserte pedunculatis, superiore apice staminifera evaginata, infima longe vaginata et longe exserta, omnibus foliaceo-bracteatis; perigyniis tristigmaticis ovatis subconicis subtriquetris brevi-rostratis multo-nervatis ore bilabiatis subscabris vix ventricosis squama ovato-oblonga cuspidata paulo longioribus vel inferne paulo brevioribus. In woods on the Colorado of Texas, and near the Rio Grande; *Wright.* Culm about a foot high, erect or flaccid, with subradical flat nerved vaginate leaves and leafy bracts nearly equalling the culm; spikes 3–6, oblong-cylindric; staminate 2, upper an inch long and pedunculate, the lower one-third as long and commonly close to it, rarely a third, which is remotish, and all bracteate; pistillate spikes 2–3, remote and pedunculate, the upper staminate at the apex, the lower longer pedunculate and exsert; all rather loosely flowered, especially towards the peduncle; stigmas three; perigynium ovate, sub-conic, slightly triquetrous, short and round, rostrate, many-nerved, bilabiate and subscabrous; scale ovate-oblong, rough cuspidate, a little shorter than the fruit, except on the lower part of the spike where it often surpasses the fruit. Differs from C. scabrata, *Schw.*, to which it is nearly related in the number of staminate spikes, and in various particulars of the fertile spikes and their fruit. Named after Mr. C. Wright, one of the exploring party.

CAREX LANUGINOSA, *Michx. Flor. Bor.-Amer.* 2, *p.* 175. Rio Mimbres and Santa Rita del Cobre, New Mexico; *Bigelow, Thurber.*

EQUISETACEÆ.*

EQUISETUM ARVENSE, *Linn.; Pursh, Fl.* 2, *p.* 651; *Braun & Engelm. in Sill. Jour.* 46, *p.* 83; *Torr. Fl. N. York,* 2, *p.* 480. Near the Mimbres, New Mexico; *Thurber.* Small sterile specimens.

EQUISETUM LÆVIGATUM, *Braun & Engelm. l. c.* Banks of the Rio Grande, near El Paso, and near the Coper Mines.

EQUISETUM ROBUSTUM, *Braun & Engelm. l. c.* Banks of the Rio Grande.

FILICES.

WOODWARDIA RADICANS, *Willd. Sp.* 5, *p.* 418; *Hook. & Arn. Bot. Beech. p.* 162 *&* 405. W. Chamissoi, *Brack. Ferns of the U. S. Expl. Exped. p.* 138. Between San Diego and the Colorado; *Schott.*

ADIANTUM CAPILLUS-VENERIS, *Linn.; Hook. Sp. Fil.* 2, *p.* 36. From San Antonio to the Rio Grande, and northward to New Mexico; common along running streams.

ADIANTUM CHILENSE, *Kaulf. Enum. p.* 207; *Hook. l. c. p.* 43. California, Texas; *Wright,* (No. 2123.)

Var. HIRSUTUM, *Hook. l. c. p.* 43, *t.* 75, *B.* A. pilosum, *Fée, Gen. Fil. p.* 118. Rocks near the mouth of the Pecos; *Bigelow.*

PTERIS AQUILINA, *Linn.* Var. *β.* LANUGINOSA, *Hook. Fl. Bor.—Am.* 2, *p.* 263; *Brack. l. c. p.* 119. P. lanuginosa, *Hook. & Arn. Bot. Beech. p.* 405; *Agardh, Gen. Pterid.* 51. ? Between San Diego and the Colorado; *Schott.*

PELLÆA FLEXUOSA, *Link. Fil. Sp. p.* 60; *Fée, Gen. Fil. p.* 129. Allosorus, *Kunze; Schk. Fil. Supp.* 1, *p.* 46, *t.* 23. Pteris, *Hook. Ic. Pl.* 2, *t.* 119. On running streams near the Rio Grande, and along the San Pedro and the Gila. (No. 825, *Wright.*)

PELLÆA ANDROMEDÆFOLIA, *Fée, l. c.* Allosorus andromedæfolius, *Kunze, Anal. Pterid. p.* 18, *t.* 11. Pteris, *Kaulf. Enum. Fil. p.* 188. Between San Diego and the Colorado; *Schott.*

PELLÆA PULCHELLA, *Fée, l. c.* Allosorus pulchellus, *Mart. & Gal. Fil. Mex. p.* 47, *t.* 10, *fig.* 1. A. formosus, *Liebmann, Mex. Breg. p.* 68. From Howard's Springs and the Pecos to the San Pedro and the Waterholes; *Bigelow, Schott.* (No. 824, *Wright.*)

PELLÆA MUCRONATA. Allosorus mucronatus, *D. C. Eaton in Sill. Jour.* (*ser.* 2,) 64, *p.* 138; *Torr. Bot. Whippl. Rep. p.* 160. Pellæa Wrightiana, longimucronata, & Ornithopus, *Hook. Sp. Fil.* 2, *p.* —, *t.* 115 & 116, (*ined.*) On rocks from the Rio Grande, westward, to the Colorado and California. (No. 2130 and 2131, *Wright.*) This fern varies in height from two inches to over a foot. In its simplest state the upper pinnæ are trifoliate, and the lower quinquefoliate; from this it varies to a state in which the secondary rachis bear numerous and minute trifoliate pinnules. Some of the forms resemble P. ternifolia, *Link. l. c.*, (Pteris ternifolia, *Hook. & Grev. Ic. Fil.* 2, *t.* 126,) but have not the narrow linear outline of that species, nor its obovate-cuneate sterile pinnules.

PELLÆA ATROPURPUREA, *Link. l. c.* Pteris atropurpurea, *Willd. Sp. Pl.* 5, *p.* 375; *Pursh, l. c.* 2, *p.* 668. Platyloma atropurpurea, *J. Smith; Torr. Fl. New York,* 2, *p.* 488. Allosorus atropurpureus, *Presl. Tent. Pterid. p.* 153.; *Gray, Manual, 2d ed. p.* 591 Along the Mimbres, New Mexico; *Bigelow.*

---

* This and the following orders of Acrogens were elaborated by Daniel C. Eaton, esq., of the Scientific School of Yale College. The Grasses will be the subject of a separate report, to be published in the Smithsonian contributions.

CHEILANTHES WRIGHTII, *Hook. Sp. Fil.* 2, *p.* 87, *t.* 110, *A.* Near the Rio Grande and the Gila.

CHEILANTHES ALABAMENSIS, *Kunze in Sill. Jour.* (*2d ser.*) 6, *p.* 87; *Hook. l. c. p.* 89, *t.* 103, *B.* Rocky and shady ravines, at the mouth of the Pecos; *Bigelow.* On the lower Rio Grande, *Schott.*

CHEILANTHES TOMENTOSA, *Link. l. c p.* 65; *Hook. l. c. p.* 96, *t.* 109, *A.* From the Rio Grande westward along the Gila to the Colorado.

CHEILANTHES LANOSA. C. vestita, *Hook. l. c. p.* 98, *t.* 108, *B.* Nephrodium lanosum, *Michx. Fl. Bor.-Am.* 2, *p.* 270? Myriopteris gracilis, *Fée, l. c. p.* 150, *t.* 29, *f.* 6. Along the Rio Grande; *Wright.* The name of C. vestita unquestionably belongs to the fern described and figured by Professor Gray under that name in the *Manual,* (*2d ed.*) *p.* 592, *t.* 10.

CHEILANTHES LINDHEIMERI, *Hook. l. c. p.* 101, *t.* 107, *A.* At the Copper Mines and in Wild-rose Pass; *Bigelow, Schott.*

CHEILANTHES FENDLERI, *Hook. l. c. p.* 103, *t.* 107, *B.* Near the Copper Mines, New Mexico; *Bigelow.* Sonora; *Parry.* Some of the specimens are fully a foot high, and have the pinnæ more remote than usually.

CHEILANTHES ASPERA, *Hook. l. c. p.* 111, *t.* 108, *A.* Lower Rio Grande; *Schott.* Near the Copper Mines and along the San Pedro; *Bigelow.* The characters of a new species of this interesting genus are subjoined.

CHEILANTHES GRACILLIMA (sp. nov.): fronde lineari-oblonga bipinnata; pinnis pinnulisque confertis, pinnulis sessilibus ovatis obtusis superne pauciter albo-pilosis subtus tomento denso fulvo obtectis, margine reflexo involucrem continuum efficienti.—Stipites ebenei plures ecaudice paleaceo subrepente erecti. Rachides primarii secundariique cum stipite juniore paleis gracilibus instructi. Cascade mountains of Oregon at 7,000 feet of altitude, latitude 44°, collected by Dr. Newberry in Williamson's Expedition, and by Dr. Bigelow in Whipple's Expedition. A very delicate little fern of the *Lendigera* group. Stipes 2–3 inches long; frond half as long, and 3–5 lines wide; pinnæ 7–10 pairs; pinnules 2–3 pairs.

HYPOLEPIS CALIFORNICA, *Hook. l. c. p.* 71, *t.* 88, *A.* Collected between San Diego and the Colorado; *Schott.*

NOTHOCHLÆNA RUFA, var. *β. Presl, Reliq. Hœnke.* 1, *p.* 19; *Martens & Galeotti, l. c. p.* 45; *Leibmann, l. c. p.* 62. Cheilanthes ferruginea, *Willd. Herb.*; *Link. l. c. p.* 65. Along the San Pedro and Rio Grande, and on the Organ mountains of New Mexico.

NOTHOCHLÆNA SINUATA, *Kaulf. l. c. p.* 135; *Kunze in Schk. Fil. Supp.* 1, *p.* 95, *t.* 65. Acrostichum, *Swartz, Syn. p.* 14. Western Texas from San Antonio to the Rio Grande, and along that river northward to New Mexico. *C. Wright, No.* 814, (1849.) A variety of this species having smaller and crenated, not pinnatifid pinnæ with whiter ciliated scales beneath, and a denser stellate pubescence above, looking through a lens like newly fallen snow, was collected in rocky places near the San Pedro and the Gila.

NOTHOCHLÆNA PULVERACEA, *Kunze in Linnæa,* 13, *p.* 135, & 18, *p.* 338; *Liebmann, Mex. Bregn. p.* 63. Lower Rio Grande; *Schott.* Rocky places on the Pecos and San Pedro; *Bigelow.* No. 820 and 2124, *Wright.* Kunze and Liebmann consider this distinct from Cheilanthes pulveracea, *Presl, Rel. Hœnk.* 1, *p.* 64; *Hook. Sp. Fil.* 2, *p.* 78.

NOTHOCHLÆNÆ CRETACEA, *Liebmann l. c. p.* 64? At Painted Camp and at the entrance to Wild-rose Pass; *Bigelow, Schott. C. Wright, No.* 821, (1849.) Our plant agrees well with the description cited, but has not been compared with authentic specimens. It grows in tufts about 6–8 inches high, and has much the appearance of Gymnogramme triangularis, *Kaulf.*;

the frond being five angled and covered beneath with a dense light-yellow farina. Stipes stout, reddish brown and shining ; frond 1–2 inches long and fully as wide.

NEUROGRAMME PEDATA, *Link, Fil. Sp. p.* 139 ; *Fée, Gen. p.* 168. Hemionitis, *Swartz, Syn. Fil. p.* 20 *&* 209, *t.* 1, *f.* 3. Along the Rio Grande, San Pedro, and Gila; mostly on rocks.

GYMNOGRAMME TRIANGULARIS, *Kaulf. Enum. p.* 73 ; *Hook. & Grev. Ic. Fil. t.* 153 ; *Hook. Fl. Bor.-Am.* 2, *p.* 259. Between San Diego and the Colorado ; *Schott.*

ASPLENIUM SEPTENTRIONALE, *Hoffmann, Deutschlands Flora,* 2, *p.* 12; *Hook. & Arn. Brit. Flor. ed.* 7, *p.* 588 ; *Lindley & Moore, Nature Printed Ferns, t.* 41, *C.* On Ben Moore, New Mexico, May ; *Bigelow.* (No. 2122, *Wright.*)

ASPLENIUM TRICHOMANES, *Linn.; Torr. Fl. New York,* 2, *p.* 491 ; *Lindl. & Moore, l. c. t.* 39. New Mexico ; *Wright,* (No. 2121.)

ASPLENIUM EBENEUM, *Willd. Sp. Pl.* 5, *p.* 329 ; *Pursh, Fl.* 2, *p.* 666 ; *Torr. Fl. New York,* 2, *p.* 492. In the Great Cañon of the Rio Grande ; *Parry.*

POLYPODIUM CALIFORNICUM, *Kaulf. Enum. p.* 102 ; *Hook. & Arn. Bot. Beech. p.* 161 *&* 405 ; *Hook. Fl. Bor.-Am.* 2, *p.* 258. (*Excl. Syn. Hook. & Grev. Ic. Fil. t.* 56.) San Diego; *Bigelow.*

POLYPODIUM INCANUM, *Willd. Sp. Pl.* 5, *p.* 174 ; *Pursh, Fl.* 2, *p.* 659 ; *Gray, Manual, p.* 590. On igneous rocks near the Great Cañon of the Rio Grande ; *Parry.*

LASTREA PATENS, *Presl, Tent. Pterid. p.* 75; *Liebmann, l. c. p.* 119. Aspidium, *Swz.; Willd. Sp. Pl.* 5, *p.* 244 ; *Hook. & Arn. Bot. Beech. p.* 162. A. molle, *Kunze in Sill. Jour.* (*ser.* 2) 6, *p.* 83. Common in western Texas and near the Rio Grande. This fern is found from Florida to Texas and in California, (*Bot. Beech. l. c.*) Our specimens agree with those from the Kew Gardens in Herb. Gray, and do not present the venation of Nephrodium molle so well shown in *Schott's Genera Filicum.*

LASTREA ARGUTA, *Brack. l. c. p.* 196. Aspidium argute, *Kaulf. l. c. p.* 242; *Torr. Bot. Whippl. Rep. p.* 160. Between San Diego and the Colorado. In *Lindley & Moore Nat. Print. Ferns,* 18, this is said to be only a larger and more developed form of L. rigida, *Presl.*

POLYSTICHUM MUNITUM, *Presl, l. c. p.* 83; *Brack. l. c. p.* 203. Aspidium munitum, *Kaulf. l. c. p.* 236; *Hook. Fl. Bor.-Am.* 2, *p.* 261. Between San Diego and the Colorado.

PHANEROPHLEBIA NOBILIS, *Presl, l. c. p.* 85 ; *Liebmann, l. c. p.* 124. Aspidium nobile, *Schlecht. Linnæa* 5, *p.* 610; *Kunze in Schk. Fil. Supp.* 1, *p.* 155, *t.* 67. A. pumilum, *Mart. & Gal. l. c. p.* 64, *t.* 17, *f.* 1. Hueco tanks in western Texas, and at Van Horn's Well.

WOODSIA OBTUSA, *Torr. Catal. pl. N. Y. Fl. N. Y.* 2, *p.* 500 ; *Hook. Sp. Fil.* 1, *p.* 62. W. Perriniana, *Hook. & Grev. Ic. Fil. t.* 68. Hills near the Copper Mines. The specimens are all small, and the pinnules are crisped and glandularly ciliated. The same form occurs on the Columbia river.

ANEMIA MEXICANA, *Klotsch in Linnæa,* 18, *p.* 526 ; *Kunze in Schk. Fil. Supp.* 2, *p.* 75, *t.* 131 ; *Hook. Ic. Pl.* 988. Clefts of rocks in a deep arroyo near the mouth of the Pecos, and at Medina creek. (No. 826 and 2117, *Wright.*)

LYCOPODIACEÆ.

SELAGINELLA RUPESTRIS, *Spring, Monog. Lycop.* 2, *p.* 55. Lycopodium rupestre, *Linn.; Hook. Fl. Bor.-Am.* 2, *p.* 267. Along the Rio Grande at Eagle Pass and at the mouth of the Pecos, &c.; *Schott, Bigelow.* (No. 2116, *Wright.*) Var. *β. Hook. l. c. excl. syn. Presl.* S. struthioloides *Torr. Bot. Whippl. Rep. p.* 159, *excl. syn. Presl.* Mountains near El Paso ; *Wright.* Organ mountains, New Mexico; *Bigelow.* Lyc. struthioloides, *Presl.* referred by Hooker, and following him by Dr. Torrey, to the slender variety of the above, was considered by Spring (*l. c.* 1, *p.* 32) a form of *Lyc. taxifolium*, though he says he did not carefully examine the original specimen in the Imperial herbarium at Vienna.

SELAGINELLA LEPIDOPHYLLA, *Spring*, *l. c. p.* 72. Lycopodium lepidophyllum, *Hook. Ic. Pl.* 2, *t.* 162, 163. In the valley of the Rio Grande, and near the San Pedro, mostly on lime rock. *C. Wright*, No. 2114, (1851–2).

HYDROPTERIDES.

MARSILEA UNCINATA, *A. Braunin Sill. Jour.* (2*d ser.*) 3, *p.* 55. New Mexico; *Dr. Bigelow*, No. 166.

MARSILEA VESTITA, *Hook. & Grev. Ic. Fil. t.* 159. San Elceario on the Rio Grande and elsewhere in western Texas. *C. Wright*, No. 2112, (1851–2).

MARSILEA MACROPODA, *A. Braun*, *l. c.* Western Texas and along the Rio Grande. *C. Wright*, No, 2111 (1851–2).

AZOLLA CAROLINIANA, *Willd. Sp.* 5, *p.* 541; *Torr. Fl. N. York*, 2, *p.* 513. Rio San Antonio, and Rio Gila.

INDEX.

THE SYNONYMS ARE PRINTED IN ITALICS.

Page.

- Abies Douglasii 210
- Abronia arenaria 170
  - cycloptera 170
  - fragrans 170
  - mellifera 170
  - *micrantha* 170
  - umbellata 170
- Abutilon crispum 39
  - holosericeum 39
  - parvulum 39
  - Texense 39
  - Thurberi 39
- Acacia *Cavenia* 62
  - constricta 62
  - Coulteri 62
  - crassifolia 62
  - cuspidata 62
  - Farnesiana 62
  - flexuosa 62
  - Greggii 61
  - *hirta* 62
  - rigidula 61
  - Rœmeriana 61
  - Schottii 62
  - tephroloba 61
  - *Texensis* 62
  - tortuosa 62
  - Wrightii 61
- Acæna pinnatifida 63
- Acalypha Caroliniana 199
  - gracilens 199
  - hederacea 200
  - phleoides 199
  - *prunifolia* 200
  - radians 200
  - Virginica 199
- Acanthaceæ 122
- Acanthochiton Wrightii 179
- Acanthogonum rigidum 177
- Acarphæa artemisiæfolia 95
- Aceraceæ 47
- Acer macrophyllum 47
- Acerates auriculata 160
  - decumbens 160
  - viridiflora 160
- Achillea millefolium 102

Page.

- Achyrachæna mollis 99
- *Achyranthes repens* 180
  - *lanuginosa* 180
  - *vermicularis* 180
- Acleisanthes anisophylla 170
  - Berlandieri 170
  - crassifolia 170
  - longiflora 170
- Actinella argentea 99
  - Bigelovii 99
  - chrysanthemoides 99
  - odorata 99
  - linearifolia 99
  - scaposa 99
- Actinolepis multicaulis 96
- Actinomeris longifolia 90
  - *pedunculosa* 92
  - Wrightii 90
- Adenophyllum Wrightii 93
- Adenostoma fasciculata 63
  - sparsifolia 63
- *Adelia ligustrina* 167
- Adhatoda *dipteracantha* 124
  - longiflora 125
- Adiantum Capillus-veneris 233
  - Chilense 233
  - *pilosum* 233
- Adolphia infesta 45
- Æsculus Californica 48
- *Agarista calliopsidea* 90
- Agassizia suavis 94
- Agave Americana 213
  - *filifera* 214
  - geminiflora 214
  - Lecheguilla 213
  - maculata 214
  - parviflora 214
  - *revoluta* 215
  - Virginica 214
- Aldama uniserialis 88
- Algarobia *dulcis* 60
  - glandulosa 60
  - *juliflora* 60
  - *Siliquastrum* 60
- Alismaceæ 212
- Allionia *albida* 174

Page.

- Allionia incarnata 169
  - *nyctaginea* 174
- Allium acuminatum 217
  - cernuum 217
  - croceum 218
  - maritimum 217
  - mutabile 217
  - reticulatum 217
  - striatum 218
- *Allosorus andromedæfolius* 233
  - *atropurpureus* 233
  - *formosus* 233
  - *mucronatus* 233
  - *pulchellus* 233
- Alnus oblongifolius 204
  - viridis 203
- Aloysia scorodonoides 126
- Alternanthera Achyrantha 180
  - lanuginosa 180
  - suffruticosa 181
- Amarantaceæ 179
- Amarantus Blitum 179
  - hybridus 179
  - *polygonoides* 179
  - tamariscinus 180
- Amaryllidaceæ 213
- Amblygona polygonoides 179
- Amblyolepis setigera 96
- Amblyopappus pusillus 96
- Ambrosia cheiranthifolia 87
  - psilostachya 87
- Amelanchier Canadensis 64
- Ammania latifolia 65
  - Wrightii 65
- Amoreuxia Scheidiana 44
  - Wrightii 44
- Amorpha *Californica* 53
  - fruticosa 53
  - lævigata 53
- Ampelopsis quinquefolia 45
- Amsinckia intermedia 140
  - lycopsoides 140
- Amsonia *angustifolia* 159
  - *ciliata* 159
  - *latifolia* 159
  - longiflora 159
  - *salicifolia* 159
  - Tabernæmontana 159
  - tomentosa 158
- Anacardiaceæ 44
- *Anantherix decumbens* 160
- Androsace occidentalis 109
- Androstephium violaceum 218
- *Androcera lobata* 152
- Anemia Mexicana 235
- Anemone Caroliniana 29
- Anemopsis Californica 203
- Anoda hastata 39
  - pentaschista 39

Page.

- Anoda Wrightii 39
- *Anoplanthus comosus* 40
- Anredera scandens 179
- Antennaora dioica 102
- *Anthericum pomeridianum* 218
- Anticlea Fremontii 222
- *Antiphytum heliotropioides* 140
- Antirrhinum Coulterianum 111
  - *majus* 111
  - Nuttallianum 111
- Aphanostephus ramosissimus 79
- Aphora humilis 196
  - lævis 196
  - lanceolata 197
  - mercurialina 197
  - pilosissima 197
  - serrata 197
- Aphyllon fasciculatum 110
  - uniflorum 110
- Apiactrum angustifolium 71
- Aploppappus ciliatus 80
  - *discoideus* 80
  - ericoides 80
  - gracilis 80
  - laricifolius 80
  - *Menziezii* 80
  - phyllocephalus 80
  - *ramulosa* 84
  - *rubiginosus* 80
  - spinulosus 80
- Apocynaceæ 158
- Apocynum cannabinum 158
- Apodanthera undulata 67
- Aquilegia Canadensis 30
  - leptocera 30
- Arabis macrocarpa 32
  - patula 32
- Arbutus Menziesii 108
- Arctostaphylos polifolia 108
  - pungens 108
  - tomentosa 108
- Arenaria *Americana* 36
  - Benthamii 36
  - diffusa 36
  - Douglasii 36
  - tenella 36
  - *tenuifolia* 36
- Argemone fruticosa 31
  - *hispida* 31
  - Mexicana 31
- *Argothamnea herbacea* 196
- Aristolochia brevipes 168
  - Californica 168
  - longiflora 168
  - *Wrightii* 168
- Aromia tenuifolia 96
- Arnica discoidea 102
- Artemisia Californica 102
  - Canadensis 102

Page.
Artemisia dracunculoides 102
    filifolia 102
    leucophyllum 102
    Ludoviciana 102
    luteoalbum 102
    Mexicana 102
    microphyllum 102
    palustre 102
    Sprengelii 102
Arthrocnemum *fruticosum* 184
    macrostachynum 184
Asclepiadaceæ 159
Asclepias arenaria 162
    brachystephana 163
    erosa 162
    fascicularis 164
    galioides 164
    incarnata 163
    involucrata 163
    Lindheimeri 164
    linearis 164
    longicornu 164
    Jamesii 162
    Linaria 164
    macrophylla 164
    macrotis 164
    nummularia 163
    obtusifolia 162
    parviflora 164
    subulata 164
    tuberosa 164
    viridiflorus 160
Aspicarpa hyssopifolia 48
    longipes 48
Aspidium argute 235
    molla 235
    munitum 235
    nobile 235
    pumilum 235
Asplenium ebeneum 235
    septentrionale 235
    Trichomanes 235
Aster angustus 77
    blephariphyllus 77
    carneus 77
    Chilensis 77
    divaricatus 77
    longifolius 77
    multiflorus 77
    Novi-belgii 77
    pauciflorus 77
    puniceus 77
    simplex 77
    Sonoræ 77
    spinosus 77
    Wrightii 78
Astragalus Bigelovii 55
    Cobrensis 55
    crotalariæ 56

Page.
Astragalus cyaneus 56
    didymocarpus 56
    Fendleri 56
    glareosus 56
    Hartwegi 56
    humistratus 55
    leucopsis 56
    Nuttallianus 55
    Sonoræ 56
    tephrodes 56
    Thurberi 56
    triflorus 56
    vacarum 56
Astrogyne crotonoides 195
Astrophyllum dumosum 42
Atragene alpina 29
    Ochotensis 29
Atriplex argentea 182
Audibertia grandiflora 132
    polystachya 132
    stachyoides 132
Avicennia tomentosa 128
Ayenia microphylla 40
    pusilla 40
Azolla Caroliniana 236

Baccharis angustifolia 83
    Bigelovii 84
    brachyphylla 83
    cærulescens 83
    consanguinea 83
    Emoryi 83
    pilularis 83
    ptarmicæfolia 83
    ramulosa 84
    salicina 83
    sergiloides 83
    Wrightii 83
Bahia absinthifolia 95
    artemisiæfolia 95
    Bigelovii 96
    biternata 95
    confertiflora 95
    pedata 96
    rubella 95
    trifida 95
Barteya multiradiata 102
    pauciradiata 101
    pleniradiata 00
Barbarea vulgaris 33
Bartlettia scaposa 102
Basella vesicaria 179
Basellaceæ 179
Batideæ 202
Batis Californica 202
    maritima 202
Battatus littoralis 148
Bellis integrifolia 79

Page.

- Berberidaceæ 30
- Berberis Aquifolium 30
  - Fremontii 30
  - trifoliata 31
- Berlandiera lyrata 85
  - Texana 85
- Berula angustifolia 70
- *Bessera* 219
- Betulaceæ 203
- Bletia aphylla 213
- Bidens Bigelovii 91
  - bipinnata 91
  - chrysanthemoides 91
  - fœniculacea 91
  - heterophylla 91
  - heterosperma 91
- Bignoniaceæ 110
- Blitum Bonus-Henricus 182
- Boehmeria cylindrica 202
- Boerhaavia anisophylla 171
  - erecta 171
  - eriosolena 172
  - gibbosa 172
  - *Grahami* 172
  - leiosotena 172
  - linearifolia 171
  - paniculata 171
  - purpurascens 171
  - scandens 172
  - spicata 171
  - Wrightii 171
- Bogenhardtia crispa 39
- Boraginaceæ 135
- Borrichia frutescens 84
- *Borga ligustrina* 167
- Bouchea Ehrenbergii 126
  - linifolia 126
  - spathulata 126
  - Wrightii 126
- *Bouchetia erecta* 156
- Bouvardia hirtella 72
- Bowlesia lobata 70
- Bradburia hirtella 81
- Brasoria truncata 134
- Brickellia baccharidea 75
  - betonicæfolia 75
  - cylindracea 75
  - floribunda 75
  - grandiflora 75
  - laciniata 74
  - oliganthes 74
  - reniformis 75
  - Riddellii 75
  - simplex 74
  - tenera 75
  - Wislizeni 74
  - Wrightii 75
  - veronicæfolia 74
- Brodiæa capitata 218

Page.

- Brodiæa *congesta* 218
  - grandiflora 218
- Bromeliaceæ 215
- Browallia Texana 156
- Buchnera elongata 117
- Buddleia Humboldtiana 121
  - marrubiifolia 121
  - racemosa 121
  - scordioides 121
- Bumelia reclinata 109
- Burrielia anthemoides 97
  - chrysostoma 97
  - Fremontii 00
  - gracilis 97
  - lanosa 96
  - platycarpha 97
- Byttneriaceæ 40

- Cacalia decomposita 103
- Cactaceæ 68
- Cæsalpina pulcherrima 60
- *Cajeput Tree* 185
- *California Olive* 185
- Calais Douglasii 104
  - linearifolia 104
  - *macrochaeta* 104
  - Parryi 104
- Calais platycarpha 105
- Calamintha glabella 129
- Calandrinia maritima 37
  - Menziesii 37
- *Calliachyris Fremontii* 99
- Calliandra Chamædrys 61
  - herbacea 61
  - humilis 61
  - reticulata 61
  - Portoricensis 61
- Callichroa platyglossa 99
- Calliproa lutea 218
- Callirhoë involucrata 38
- Calochortus luteus 217
  - splendens 217
  - uniflorus 217
  - venustus 217
- Calophanes *linearis* 122
  - oblongifolius 122
- Calycadenia Fremontii 100
  - pauciflora 100
  - tenella 100
- Calycoseris Parryi 106
  - Wrightii 106
- *Calymenia angustifolia* 175
  - *albida* 174
  - *decumbens* 175
  - *floribundus* 174
  - *hirsuta* 174
  - *pilosa* 174
- Calystegia *Maximiliana* 148
  - sepium 148

Page.
Calystegia Soldanello 148
Calyxhymenia ovata 173
Camassia Fraseri 218
Campanulaceæ 108
Campanula rotundifolia 108
perfoliata 108
Campylocera leptocarpa 108
Cañatilla 208
Capparidaceæ 35
Capraria multifida 117
Caprifoliaceæ 71
Capsella Bursa-pastoris 35
Capsicum microphyllum 152
Carbilleja sessilifolia 119
tomentosa 118
Cardamine angulata 32
Cardiospermum Halicasabum 47
Carex Barbaræ 231
cephalophora 229
Darwinii 231
decidua 230
Douglasii 229
Emoryi 230
festiva 229
Hoodii 229
Hookeriana 230
hystricina 232
lanuginosa 232
Liddoni 229
marcida 229
monticola 229
phyllostachys 231
recta 230
Schottii 231
siccata 229
stricta 230
Thurberi 232
umbellata 232
Wrightii 232
Carminatia tenuiflora 74
Carphephorus junceus 74
Carphochæte Bigelovii 74
Carya olivæformis 205
Caryophyllaceæ 36
Casparia 59
Cassia bauhinioides 59
Chamæcrista 59
chamæcristoides 59
cinerea 59
Lindheimeriana 59
nictitans 59
obtusifolia 59
pumilio 59
Rœmeriana 59
Wislizeni 59
Wrightii 59
Castanea chrysophylla 205
Castela Nicholsoni 44
Castilleja affinis 119

Page.
Castilleja angustifolia 118
candens 119
fulgens 119
hispida 119
indivisa 118
integra 119
lanata 118
laxa 119
linariæfolia 119
purpurea 118
Ceanothus crassifolius 46
cuneatus 45
dentatus 46
divaricatus 45
Greggii 45
Lobbianus 45
macrocarpus 45
ovalis 45
rigidus 45
sorediacus 45
spinosus 45
thyrsiflorus 45
Cedronella cana 133
Mexicana 133
pallida 133
Celastraceæ 47
Celtis *crassifolia* 203
integrifolia 203
Mississippiensis 203
occidentalis 203
orthocanthos 203
pallida 203
Centaurea Americana 103
Centauridium Drummondi 81
Centrostegia Thurberi 177
Centrosæma Virginiana 50
Cephalanthus occidentalis 72
Cerasus Virgiana 62
Ceratophyllaceæ 203
Ceratophyllum demersum 203
Cercis occidentalis 58
Cercidium floridum 59
Texanum 59
Cercocarpus *Cetulifolius* 63
parvifolius 63
Cevallia sinuata 66
Chætocalyx Schottii 56
Wislizeni 56
Chanuzo 184
Cheilanthes Alabamensis 234
aspera 234
Fendleri 234
gracillima 234
lanosa 234
Lindheimeri 234
tomentosa 234
vestita 234
Wrightii 234
Cheiranthus asper 32

Page.

- Cheiranthus *capitatus* 00
- Chenactis carphoclinia 94
  - stevioides 94
  - tenuifolia 94
- Chenopodiaceæ 182
- Chenopodium album 182
  - anthelminticum 182
- Chilopsis *glutinosa* 110
  - linearis 110
- Chipatane 152
- Chlorogalum pomeridianum 218
- Chorizanthe angustifolia 177
  - brevicornu 177
  - diffusa 177
  - fimbriata 177
  - procumbens 177
- Chrysaetina Mexicana 93
- Chrysopsis canescens 81
  - foliosa 81
  - hispida 81
  - pilosa 81
  - villosa 81
- Chrysoscordium 218
- *Chthamalia* biflora 165
  - *pubiflora* 165
- Cicuta maculata 70
- Cirsuim Coulteri 103
  - Grahami 103
  - Neomexicanum 103
  - *ochrocentrum* 103
  - undulatum 103
  - Virginicum 103
  - Wrightii 103
- Cistaceæ 36
- Cladium effusum 229
- Clappia suædæfolia 93
- Claytonia perfoliata 38
  - Virginica 38
- Clematis Drummondii 29
  - lasiantha 29
  - ligusticæfolia 29
  - *pauciflora* 29
  - *Peruviana* 29
  - Pitcheri 29
  - reticulata 29
- Cleomella augustifolia 35
  - longipes 35
  - Sonoræ 35
- Cocculus Carolinus 30
- Coinogyne carnosa 101
- *Coldenia* canescens 136
- Collomia gracilis 145
  - grandiflora 145
- Comandra *pallida* 185
  - unbellata 185
- Commelynaceæ 223
- Commelyna *augustifolia* 223
  - linearis 224
  - Virginica 223

Page.

- Coniferæ 207
- Conobea intermedia 117
  - multifida 117
- Conoclinium betonicum 76
  - cœlestinum 76
  - dissectum 76
- Cordylanthus filifolius 120
  - laxiflorus 120
  - Wrightii 120
- Coreopsis calliopsidea 90
  - cardaminefolia 90
  - Drummondii 90
- Corethrogyne filaginifolia 76
  - incana 76
- Cornaceæ 71
- Cornus Nuttallii, *Audub.* 71
  - pubescens 71
- Cowania ericæfolia 63
  - Mexicana 63
  - Stansburyana 63
- Cnidoscolus angustidens 198
  - *Michauxii* 198
  - stimulosus 198
- Cochlospermeæ 44
- Collinsia bicolar 111
- Cologania longifolia 51
  - pulchella 51
- Colubrinia Texensis 47
- Compositæ 73
- Condalia obovata 47
  - spathulata 47
- Convolvulaceæ 148
- Convolvulus Californicus 148
  - *dissectus* 149
  - *hastatus* 148
  - Hermanniæ 148
  - lobatus 148
  - Nuttallii 148
  - *obtusifolius* 148
- Cooperia Drummondii 215
  - pedunculata 215
- Corchorus pilolobus 40
- Cordia Bossieri 135
  - Greggi 135
  - podocephala 135
- Corispermum hyssopifolium 184
- Corydalis aurea 32
- *Cosmanthus viscidus* 143
- Cosmos bipinnatus 91
- *Cotton-wood* 204
- Crassulaceæ 68
- Crepis ambigua 107
- Cressa Cretica 151
  - *Truxillensis* 151
- Cristatella Jamesii 35
- Crocidum multicaule 102
- Crotalaria lupulina 57
  - sagittalis 57
- Croton argyranthemum 195

Page.

- Croton Berlandieri 193
  - capitatum 195
  - *ellipticum* 196
  - fruticulosum 194
  - glandulosum 196
  - *gracile* 195
  - Lindheimerianum 194
  - maritinium 195
  - *monanthogynum* 195, 196
  - muricatum 195
  - penicillatum 196
  - procumbens 195
  - Sonoræ 194
  - suaveolens 194
  - syringæfolium 196
  - trichocarpum 196
- Cruciferæ 32
- Crypheanthus Barbadensis 122
- *Cryptopleura Californica* 106
- Cucurbitaceæ 67
- Cucurbita digitata 67
  - perennis 67
- *Cunila glabella* 129
- Cuphea Wrightii 65
- Cupressus *disticha* 210
  - Goveniana 211
  - *Macnabiana* 211
  - *macrocarpa* 211
- Cupuliferæ 205
- Cuscuta 151
- Cyclobothia alba 217
- Cyclanthera dissecta 67
- Cymopterus Fendleri 70
  - montanus 70
- Cynanchum augustifolium 164
- Cynoglossum grande 142
  - pilosum 142
- Cyperaceæ 226
- Cyperus aristatus 226
  - articulatus 226
  - Baldwinii 227
  - diandrus 226
  - dissitiflorus 227
  - Drummondii 227
  - filiculmus 227
  - flavicomus 226
  - *Gatesii* 226
  - *gracilis* 227
  - Haspan 227
  - *Houghtonii* 227
  - lateriflorus 226
  - *leptos* 227
  - lutescens 227
  - Michauxianus 226
  - microdontus 227
  - ovularis 227
  - *phymatodes* 227
  - repens 227
  - Schweinitzii 227

Page.

- Cyperus setigerus 227
  - *speciosus* 226
  - tetragenus 226
  - trachynotus 227
  - virens 227
- Dalea albiflora 52
  - alopecuroides 52
  - aurea 52
  - argyrea 52
  - brachystachys 52
  - Emoryi 52
  - filiformis 52
  - formosa 52
  - frutescens 53
  - Greggii 52
  - Jamesii 52
  - lachnostachys 52
  - lævigata 52
  - lanata 52
  - lasianthera 52
  - nana 52
  - mollis 52
  - pogonathera 52
  - polygonodes 52
  - Schottii 53
  - scoparia 52
  - spinosa 53
  - Wislizeni 52
  - Wrightii 52
- Dasylirion Biglovii 216
  - erumpens 216
  - graminifolium 215
  - Lindheimerianum 216
  - tenuifolium 215
- *Datili* 221
- Datura metel 154
  - meteloides 154
  - *Stramonium* 155
  - Thomasii 155
- Daubentonia longifolia 51
  - Thurberi 51
- Daucosma laciniatum 70
- Daucus pusillus 71
- Delphinium azureum 30
  - Californicum 30
  - cardinale 30
  - *coccineum* 30
  - decorum 30
  - Menziesii 30
  - nudicaule 30
  - patens 30
  - scopulorum 30
- Dendromecon rigidum 32
- Desmanthus Jamesii 60
  - velutinus 60
- Desmodium annuum 56
  - cinerascens 57
  - exiguum 57

Page.
Desmodium Grahami 56
    Neo-Mexicanum 57
    paniculatum 57
    Wrightii 57
Deweya arguta 70
Dianthera Americana 124
Diaperia prolifera 84
Dicentra chrysantha 32
Dichelostemma congestum 218
Dichondra argentea 151
    Carolinensis 151
    repens 151
Dichromena leucocephala 229
Dicliptera resupinata 125
    thlaspoides 125
Dicoria canescens 87
Dicranocarpus parviflorus 85
Diodia teres 72
Diospyrus Texana 109
Diplacus glutinosus 116
Diplopappus ericoides 78
    modesta 78
Dipteracanthus *nudiflorus* 122
    suffrudicosus 122
Dithyræa Californica 34
    Wislizeni 34
Dodecatheon *frigidum* 109
    integrifolium 109
    Meadia 109
Dodonæ Scheidiana 48
Draba micrantha 33
Dracocephalum parviflorum 133
    Virginianum 134
Drejera Greggii 124
    juncea 124
    puberula 123
    Thurberi 124
Drymaria diffusa 37
    frankenioides 37
    glandulosa 37
    spergulastroides 37
Dryopetalum runcinatum 32
Dysmicodon ovatum 108
    perfoliatum 108
Dysodia chrysanthemoides 93
    porophylloides 93

Ebenaceæ 109
Echeandia terniflora 219
Echeveria lanceolata 69
    pulverulenta 68
    strictiflora 68
Echinospermum deflexum 142
    Lappula 142
    patulum 142
    strictum 142
    Texanum 142
Echites brachysiphon 158
    hypoleuca 158
    macrosiphon 158

Page.
Eclipta erecta 84
Eddya hispidissima 136
Ehretia elliptica 136
Elaterium Coulteri 68
    Wrightii 68
Elatinaceæ 36
Elatine Americana 36
Eleocharis acicularis 228
    arenicola 228
    capitata 228
    cellulosa 228
    Elliottii 228
    equisetoides 228
    obtusa 228
    palustris 228
    rostellata 228
    tenuis 228
Ellisia chrysanthemifolia 143
    membranacea 143
Elytraria tridentata 122
Elytrospermum Californicum 228
Emmenanthe penduliflora 145
Emorya sauveolens 121
Encelia Californica 88
    conspersa 88
    farinosa 88
    nivea 88
Endotheca 180
Engelmannia pinnatifida 85
Engelmannia Nuttalliana 196
Ephedra antisiphilitica 207
Epilobium coloratum 65
Epipactis gigantea 213
Epixiphium mauraudioides 111
Equisetaceæ 233
Equisetum arvense 233
    lævigatum 233
    robustum 233
Eremocarpus setigerus 196
Ericaceæ 108
Ericameria ericoides 80
Erigeron Bellidiastrum 78
    Bigelovii 78
    Canadense 77
    delphinifolium 77
    divergens 77
    Douglasii 77
    ericoides 78
    eriophyllum 77
    glaucum 78
    macranthum 77
    modestum 78
    subdecurrens 78
Eriodyction Californicum 148
    crassifolium 148
    tomentosum 148
Eriogonum Abertianum 177
    acetoselloides 176
    alatum 175

Page.
Eriogonum annuum 176
  cernuum 177
  ciliatum 175
  cordatum 176
  cymosum 176
  fasciculatum 176
  gracile 176
  helianthifolium 176
  hieracifolium 175
  Jamesii 176
  longifolium 175
  multiflorum 176
  pharnaceoides 177
  platyphyllum 176
  polifolium 176
  rotundifolium 177
  tenellum 176
  Thurberi 176
  trichopodum 176
  vimineum 176
  virgatum 176
  Wrightii 176
Eritrichium angustifolium 141
  Chorisianum 141
  crassisepalum 141
  floribundum 140
  glomeratum 140
  heliotropioides 140
  Jamesii 140
  micranthum 141
  pectocaryum 142
  pusillum 141
Erodium cicutarium 41
  macrophyllum 41
  Texanum 41
Eryngium diffusum 70
  Leavenworthii 70
  Wrightii 70
Erysimum asperum 33
  grandiflorum 32
Erythrina coralloides 50
  herbacea 50
Erythræa Beyrichii 157
  chironioides 156
  Centaurium 156
  floribunda 157
  Muhlenbergii 157
  Texensis 157
  tricantha 157
Eschscholtzia Californica 31
  Douglasii 31
Euchroma purpurea 118
Eucnide bartonioides 67
Eunanus Fremonti 116
Eupatorium azureum 76
  Berlandieri 76
  Bigelovii 75
  conyzoides 76

Page.
Eupatorium Parryi 75
  Scheideanum 76
  serotinum 76
  solidaginoideum 76
  spinaceæfolium 75
  Wrightii 76
Euphorbia *acuta* 187
  albomarginata 186
  anceps 187
  angusta 189
  antisiphilitica 103
  arenaria 185
  Arizonica 186
  Arkansana 191
  barbellata 190
  bifurcata 190
  bilobata 190
  brachycera 192
  callibrichoides 187
  campestris 192
  capitellata 188
  cinerascens 186
  colorata 190
  crenulata 192
  cyathophora 190
  dentata 190
  dictyosperma 191
  dilatata 188
  dioica 187
  eriantha 191
  esulæformis 192
  exigua 191
  exstipulata 189
  Fendleri 186
  florida 189
  glyptosperma 187
  hermarioides 185
  heterantha 190
  heterophylla 190
  hexagona 189
  hypericifolia 188
  inequilatera 187
  lata 188
  Lathyris 193
  longicruris 191
  microphylla 186
  misera 193
  montana 192
  multicaulis 191
  Nilagirica 187
  pediculifera 186
  Peplidion 191
  Peploides 191
  Peplus 191
  petaloidea 185
  pilulifera 188
  polycarpa 186
  polygonifolia 187

Page.

- Euphorbia prostrata 187
  - pycnanthema 188
  - radians 191
  - revoluta 186
  - *rupicola* 186
  - serpens 185
  - Serrula 188
  - stictosperma 187
  - *tenella* 187
  - tetrapora 191
  - trachysperma 189
  - villifera 188
  - Wrightii 191
- Euphrosyne ambrosiæfolia 86
- Euploca convolvulacea 139
- Eurotia lanata 184
- Euryptera lucida 70
- Eustoma *exaltatum* 157
  - Russelianum 157
- *Eutoca Douglasii* 143
  - *loasæfolia* 143
  - *viscida* 143
- Evax caulescens 84
- Evolvulus alsinoides 150
  - argenteus 150
  - *discolor* 150
  - holosericeus 150
  - *Nuttalianus* 150
  - ovalifolius 150
  - pilosus 150
  - *sericeus* 150
- Eysenhardtia amorphoides 51
- Fagonia Californica 42
- Fallugia paradoxa 64
- Fendlera rupicola 69
- Filaginopsis *Drumondii* 84
  - multicaulis 84
- Filago Californica 102
- Filices 233
- Fimbristylis *capillaris* 229
  - *cylindrica* 229
  - spadicea 229
- Flaveria chloræfolia 92
  - Contragerba 92
- Florestina tripleris 94
- Flourensia cernua 88
- Forestiera angustifolia 168
  - ligustrina 167
  - phillyreoides 167
  - *pubescens* 167
  - reticulata 167
  - sphærocarpa 168
- Fouqueriaceæ 148
- Fouqueria splendens 148
- Fragaria Chilensis 64
  - vesca 64
- Frangula Californica 46
  - Caroliniana 46
- Frankenia grandifolia 36

Page

- Frankeniaceæ 36
- Franseria *albicaulis* 87
  - *chenopodifolia* 87
  - *confertifolia* 87
  - deltoidea 87
  - dumosa 87
  - *fruticosa* 87
  - Hookeriana 87
  - tenuifolia 87
- Frasera Parryi 156
  - speciosa 156
- Fraxinus *Berlanderiana* 166
  - cuspidata 166
  - dipetala 167
  - pistaciæfolia 166
  - Scheidiana 166
  - *velutina* 166
  - viridis 166
- Fritillaria Kamtschatcensis 217
  - lanceolata 217
  - *mutica* 217
- Frœlichia Drummondii 182
  - Floridana 182
  - gracilis 182
- Fuirena squarrosa 227
- Fumariaceæ 32

- Gaillardia lanceolata 94
  - pulchella 94
- Galaetia canescens 50
  - marginalis 50
  - tephrodes 50
  - Wrightii 51
- Galinsoga parviflora 99
- Galium Aparine 72
  - asperimum 72
  - Californicum 72
  - microphyllum 72
  - proliferum 72
  - suffruticosum 72
  - Wrightii 72
- Galphimia linifolia 48
- Garryaceæ 205
- Garrya elliptica 205
  - Lindheimeri 205
  - Wrightii 205
- Gaultheria Shallon 108
- Gaura coccinea 96
  - Drummondii 66
  - parviflora 66
  - suffulta 66
  - villosa 66
- Stenosiphon virgatus 66
- Eulobus Californicus 66
- Jussiæa repens 66
- *Geiseleria glandulosa* 196
- Gentianaceæ 156
- Gentiana affinis 157
  - detonsa 157

Page.

- Gentiana quinqueflora 157
- *Geræa canescens* 89
- Geraniaceæ 41
- Geranium cæspitosum 41
  - Carolinianum 41
- Gerardia heterophylla 118
  - purpurea 118
  - Wrightii 118
- Gilia achilleæfolia 146
  - aggregata 146
  - androsacea 147
  - aurea 147
  - Californica 147
  - capitata 146
  - densiflora 147
  - dianthoides 147
  - dichotoma 147
  - Gunnisoni 146
  - incisa 146
  - inconspicua 146
  - longiflora 146
  - lutea 147
  - multiflora 146
  - multicaulis 146
  - pharnaceoides 147
  - polycladon 146
  - rigidula 147
  - tricolor 146
  - virgata 146
- *Glandularia bipinnatifida* 128
- Glottidium Floridanum 51
- Glycyrrhiza *glutinosa* 53
  - lepidota 53
- Gomphrena cæspitosa 181
  - decumbens 181
  - globosa 181
  - Sonoræ 181
- Gonolobus biflorus 165
  - cynanchoides 165
  - granulatus 165
  - parvifolius 166
  - productus 165
  - *prostratus* 165
  - *unifarius* 160
- Gratiola pusilla 117
- Gossypianthus rigidiflorus 180
  - *tenuiflorus* 180
- Greggia camporum 33
- Grindelia arguta 81
  - inuloides 81
  - lanceolata 81
  - *microcephala* 81
  - squarrosa 81
- Grossulaceæ 68
- Guardiola platyphylla 91
- Guiacum Coulteri 42
- Guilleminea densa 180
- Gutierrezia eriocarpa 79
  - Euthamiæ 79

Page.

- Gutierrezia gymnospermoides 79
  - microcephala 79
  - sphærocephala 79
  - Texana 79
  - Wrightii 79
- Gymnogramme triangularis 235
- Gymnosperma corymbosum 79
- Gynamblosis monanthogyna 196
- *Gyrandra chironioides* 156
- Habranthus Andersoni 215
- Halea Texana 88
- Haplöesthes Greggii 102
- Haplophyton cimicidum 159
- Harpæcarpus exiguus 101
- Hedeoma dentata 130
  - *acinoides* 131
  - Drummondi 131
  - incana 130
  - mollis 129
  - plicata 130
- *Hedyotis acerosa* 72
  - *humifusa* 72
  - *rubra* 72
- Helenium autumnale 98
  - microcephalum 98
  - puberulum 98
  - tenuifolium 98
- Helianthemum Carolinianum 36
  - scoparium 36
- Helianthus angustifolius 90
  - argophyllus 90
  - cucumerifolius 90
  - ciliaris 90
  - grosse-serratus 90
  - lenticularis 90
  - maximiliani 90
  - petiolaris 90
  - *præcox* 90
  - tephrodes 90
- Heliomeris multifloris 88
  - tenuifolia 88
- Heliophytum glabriusculum 139
  - molle 138
  - parviflorum 138
- Heliopsis buphthalmoides 88
  - *canescens* 88
  - parvifolia 88
- Heterospermum tagetinum 91
- Heliotropium angustifolium 137
  - Curassavicum 136
  - Greggii 137
  - inundatum 137
  - limbatum 138
  - *parviflorum* 138
  - phyllostachyum 137
  - tenellum 138
- Hemicarpha subsquarrosa 229
- Hemiptilium Schottii 105
  - Bigelovii 105

Page.
Hemizonia *angustifolia* 100
corymbosa 100
decumbens 100
congesta 100
fasciculata 99
filipes 101
multicaulis 100
ramosissima 100
virgata 100
Hendecandra multiflora 195
maritima 195
procumbens 195
Texensis 195
Heracleum lanatum 71
Hermannia Texana 40
Herpestis chamædrioides 116
cuneifolia 117
monniera 117
nigrescens 116
rotundifolia 117
Heteranthera *graminea* 223
limosa 223
Heterospermum dicranocarpum 85
Heterotheca floribunda 81
scabra 81
Heuchera micrantha 69
parvifolia 69
rubescens 69
Hibiscus cardiophyllus 40
Coulteri 40
denudatus 40
Hieracium longipilum 107
Hiræa septentrionalis 00
Hoffmanseggia caudata 58
Jamesii 58
melanosticta 58
mycrophylla 58
oxycarpa 58
stricta 58
Holacantha Emoryi 45
Hookelia paradoxa 64
Hosackia argophylla 55
brachycarpa 55
cytisoides 65
gracilis 54
juncea 55
maritima 54
oblongifolia 54
puberula 55
Purshiana 55
rubella 54
scoparia 55
strigosa 54
subpinnata 55
tomentosa 55
unifoliolata 55
Wrightii 55
Wrangeliana 55
Hulsea Californica 98
nana 98

Page.
Humalus Lupulus 203
Americanus 203
Hydrocharidaceæ 223
Hydrochàris spongiosa 223
Hydrocotyle natans 69
ranunculoides 69
umbellata 69
Hydrophyllaceæ 142
Hydropterides 236
Hymenatherum acerosum 93
Gnaphaliopsis 93
pentachætum 93
polychætum 93
tenuifolium 93
Wrightii 93
Hymenoclea monogyra 88
Hymenolobus divaricatus 35
pubens 34
Hymenopappus corymbosus 95
flavescens 95
luteus 94
Hymenothrix Wizlizeni 96
Wrightii 96
Hymenoxys calva 97
Hypericaceæ 36
Hypericum formosum 36
Scouleri 36
Hypolepis Californica 234
Hyptis lanata 129
spicata 129
Jacquinia pungens 109
macrocarpa 109
Janipha Lœflingii 199
manihot 199
Yuquilla 199
Janusia gracilis 48
Jasminaceæ 168
Jatropha Berlandieri 198
macrorhiza 198
Janipha 199
multifida 198
Illecebrum celosoides 180
vermiculatum 180
Indigofera leptosepala 51
Lindheimeriana 51
Infantea Chilensis 96
Ionidium lineare 36
Ipomœa commutata 149
costellata 149
dissecta 149
fastigiata 150
heterophylla 149
lacunosa 149
leptotoma 150
longifolia 149
muricata 150
Nil 149
orbicularis 149
pandurata 148

Page.

- Ipomœa Pes-Capræ 149
  - *Shumardiana* 149
  - sinuata 149
  - tenuiloba 148
  - *trichocarpa* 149
- *Ireneis* 180
- Iresine diffusa 180
  - vermicularis 180
- Iridaceæ 216
- Iris macrosiphon 216
- Isocarpha 73
- Isolepis capillaris 229
  - *subsquarrosa* 229
- Isomeris arborea 35
- Juglandaceæ 205
- Juglans *olivæ formis* 205
  - *pyriformis* 205
  - rupestris 205
- Junaceæ 222
- Juncus articulatus 223
  - Balticus 222
  - bufonius 223
  - debilis 222
  - longistylis 223
  - lamprocarpus 223
  - marginatus 223
  - Menziesii 222
  - nodosus 223
  - *polycephalus* 222
  - tenuis 223
  - xiphioides 223
- Juniperus *Andina* 211
  - occidentalis 210
  - pachyphlæa 210
  - tetragona 210
  - Virginiana 211
- *Justicia pedunculosa* 124
- Iva dealbata 86
- *Ixia acuta* 216
- Kallstrœmia grandiflora 42
  - maxima 42
- Karwinskia Humboldtiana 47
- Keerlia bellidifolia 78
- Kœberlinia spinosa 42
- Kosteletzkia paniculata 40
- Krameria canescens 49
  - lanceolata 49
  - parvifolia 49
- Krameriaceæ 49
- Krinitzkia leiocarpa 142
- Kuhnia eupatorioides 74
- Labiatæ 129
- Lachnostoma parviflora 165
- Lagophylla dichotoma 101
  - filipes 101
- Lantana canescens 127
  - horrida 128
  - macropoda 127
  - odorata 128

Page.

- Laphamia angustifolia 81
  - bisetosa 82
  - cinerea 82
  - dissecta 82
  - halimifolia 81
  - rupestris 82
- Larrea Mexicana 42
- Lasthenia glabrata 97
- Lastrea arguta 235
  - patens 235
- Lathyrus linearis 49
  - palustris 49
  - polymorphus 49
  - maritimus 49
  - venosus 49
  - vestitus 49
- Lauraceæ 184
- Layia carnosa 99
  - Fremontii 99
  - heterotricha 99
  - hieracioides 99
  - Neo-Mexicana 99
  - platyglossa 99
- Lebetina cancellata 93
- Leguminosæ 49
- Lemnaceæ 211
- Lemna minor 211
  - polyorrhiza 211
  - trisulca 211
- Lentibulaceæ 110
- Lepachys columnaris 88
  - Tagetes 88
- Lepiana 93
- Lepidanthus phyllanthoides 193
- Lepidium alyssoides 34
  - Californicum 34
  - intermedium 34
  - latipes 34
  - nitidum 34
  - Wrightii 34
- Leptocaulis echinatus 70
- *Leptoglossis schwenkioides* 156
- Leptosyne Douglasii 91
  - Stillmanni 91
- Lepuropetalon spathulatum 69
- Leria nutans 104
- Lespedeza violacea 57
- *Leucanthea Rœmeriana* 156
- Leucophyllum *ambiguum* 115
  - minus 115
  - Texanum 115
- Liatris punctata 74
- Libocedrus decurrens 211
- Lileaceæ 217
- Limnanthaceæ 42
- Limnanthes Douglasii 42
- Limnobium spongia 223
- Linaceæ 40
- Linum Berlandieri 40

Page.
Linum multicaule 40
perenne 40
rigidum 40
rupestre 40
Linaria Canadensis 111
Linosyris arborescens 79
carnosa 80
coronopifolia 80
Drummondii 80
gracilis 80
graveolens 80
Menziesii 80
Mexicana 80
pulchella 80
ramulosa 84
viscidiflora 80
Wrightii 80
Lippia Berlandieri 127
geminata 127
lycioides 127
nodiflora 127
Lithophragma Cymbalariae 69
heterophylla 69
Lithophragma prostrata 155
Lithospermum breviflorum 140
canescens 139
incisum 140
longiflorum 140
Metamorense 140
Lithræa laurina 44
Loasaceæ 66
(Lobelia) *fissa* 107
laxiflora 107
pectinata 107
puberula 107
Texensis 107
Lobeliaceæ 107
Lobelia amœna 107
Berlandieri 107
cardinalis 107
Cliffortiana 107
fenestralis 107
Lœselia glandulosa 147
Loganiaceæ 121
Lonicera dumosa 71
involucrata 71
subspicata 71
Lowellia aurea 93
Lucæna retusa 61
Ludwigia natans 66
Lupinus affinis 57
albifrons 57
arboreus 57
bicolor 57
cytisoides 57
densiflorus 57
Douglasii 57
hirsutissimus 57
littoralis 58

Page.
Lupinus *menziesii* 57
Mexicanus 57
micranthus 57
ornatus 57
pusillus 57
rivularis 57
sparsiflorus 57
subcarnosus 57
truncatus 57
Luzula campestris 223
Lycium barbanode 154
Berlandieri 154
pallidum 154
stolidum 154
Lycopodiaceæ 235
Lycopodium lepidophyllum 235
rupestre 235
strutheoloides 236
taxifolium 236
Lycopus Europæus 129
exaltatus 129
sinuatus 129
Lygodesmia aphylla 107
Lythraceæ 65
Lythrum alatum 65
Machæranthera canescens 77
parviflora 77
tanacetifolia 77
Macromeria viridiflora 139
Macrorhynchus *Californicus* 106
Chilensis 106
heterophyllus 106
Lessingii 107
Madia sativa 101
Madronia 108
Malacochete 228
Malacothrix Californica 106
Coulteri 106
Fendleri 106
obtusa 106
tenuifolia 106
Malpigia glabra 48
Malpigiaceæ 48
Malva *Americana* 38
borealis 38
Monroana 38
Malvaceæ 38
Malvastrum Americanum 38
coccineum 38
leptophyllum 38
Monroanum 38
pedatifidum 38
Thurberi 38
Malvaviscus Drummondii 40
Mansinita 108
Margaranthus solanaceus 154
Marrubium vulgare 134
Marsilea macropoda 236
uncinata 236

Page.
Marsilea vestita 236
Martynia arenarea 110
  violacea 110
Matricaria discoidea 102
Maurandia antirrhiniflora 110
  Wislizeni 111
Maytenus phyllanthoides 47
Meconella Californica 31
Meconopsis heterophylla 31
Medicago denticulata 53
  sativa 53
Melampodium cinereum 85
  hispidum 85
  longicornu 85
Melanthaceæ 222
Melilotus *occidentalis* 54
  parviflora 54
Melochia pyramidata 40
  tomentosa 40
Menispermaceæ 30
Menodora heterophylla 168
  longiflora 168
  scabra 168
Mentha canadensis 129
Mentzelia albicaulis 67
  multiflora 67
  oligosperma 67
  Wrightii 67
Metastelma angustifolia 159
  barbigerum 159
  Schlechtendalii 159
Micromeria Douglasii 129
  Xalapensis 129
Mekania scandens 76
Milla biflora 219
  cærulea 219
Mimosa Berlandieri 61
  biuncifera 61
  borealis 60
  dysocarpa 60
  flexuosa 61
  fragrans 60
  Lindheimeri 60
  malacophylla 60
  strigillosa 61
Mimulus brevipes 116
  cardinalis 116
  glabratus 116
  glutinosus 116
  luteus 115
  rubellus 116
  Scouleri 115
Mirabilis *aggregata* 174
  Californica 169
  longiflora 169
  multiflora 169
  oxybaphoides 169
Mitreola petiolata 121
Monarda aristata 132
  fistulosa 133

Page.
Monarda *Lindheimeri* 133
  pectinata 132
  punctata 132
Monardella candicans 129
  odoratissima 129
  undulata 129
  villosa 129
Monechma Pilosella 124
Monniera cuneifolia 117
Monnina Wrightii 49
Monolopia major 97
Montelia tamariscina 180
Moquinia hypoleuca 103
Mortonea Greggii 47
  scabrella 47
  sempervirens 47
Morus rubra 203
Mozzina canescens 198
  cardiophylla 198
  spathulata 197
Mucronea Californica 177
Mulgedium pulchellum 107
Myosotes suffruticosa 140
Myosurus minimus 29
Myriophyllum heterophyllum 66

Naiadaceæ 211
Naias *Canadensis* 211
  flexilis 211
Nama dichotoma 147
  Jamaicensis 148
Nasturtium curvisiliqua 33
  obtusum 33
  palustre 33
  sessiliflorum 33
Navarretia atractyloides 145
  Schottii 145
Negundo aceroides 47
  Californicum 47
Nemacladus ramosissimus 108
Nemastylis acuta 216
  geminiflora 216
Nemophila aurita 142
  liniflora 142
  pedunculata 142
  parviflora 142
Neptunea lutea 60
Nesæa longipes 65
  salicifolia 65
Neurogramme pedata 235
Nicolletia Edwardsii 93
Nicotiana pandurata 155
  Rœmeriana 155
Nierembergia viscosa 155
  anomala 156
Notochlæna cretacea 234
  pulveracea 234
  rufa 234
  sinuata 234
Nuttalia cerasiformis 63
Nyctaginaceæ 168
Nyctaginia capitata 170

Page.
Nyctaginia *obtusa* 170
  Torreyana 169
Nycterium lobatum 152
  luteum 152
Nymphæaceæ 31
Nymphæa advena 31
Obione argentea 182
  acanthocarpa 183
  Barclayana 183
  canescens 182, 183
  confertiflora 183
  elegans 183
  linifolia 184
  occidentalis 184
  radiata 183
Ocotillo 103
Œnothera albicaulis 65
  biennis 65
  bistorta 66
  brachycarpa 65
  cardiophylla 66
  chamænerioides 66
  clavæformis 66
  coronopifolia 65
  gauræflora 66
  Hartwegi 66
  Jamesii 65
  lavendulæfolia 66
  marginata 65
  Missouriensis 65
  primiveris 65
  rosea 65
  serrulata 65
  sinuata 65
  triloba 65
  tubicola 66
  viminea 66
  vinosa 66
  Wrightii 66
Oldenlandia acerosa 72
  angustifolia 72
  humifusa 72
  rubra 72
Oleaceæ 166
Oligogyne Tampicana 92
Oligomeris glaucescens 35
Olneya Tesota 58
Onagraceæ 65
Onosmodium Carolinianum 139
Oplotheca Floridana 182
  gracilis 182
Orchidaceæ 213
Oreodaphne Californica 184
Ornithogalum Michauxii 220
  Texanum 220
Orobanchaceæ 110
Orobanche comosa 110
  fasciculata 110
  Ludoviciana 110
  uniflora 110

Page.
Orthocarpus densiflorus 120
  erianthus 120
  lacerus 120
  purpurascens 120
Osmadenia tenella 100
Osmorrhiza brachypoda 71
  occidentalis 71
Oxalidaceæ 41
Oxalis Berlandieri 41
  decaphylla 41
  dichondræfolia 41
  Drummondii 41
  stricta 41
  violacea 41
  Wrightii 41
Oxybaphus aggregatus 168
  angustifolius 169
  Cervantesii 174
  coccineus 169
  glabrifolius 168
  glabrifolius 169
  hirsutus 169
  lævis 169
  multiflorus 169
  nyctagineus 169
  ovatus 173
  oxybaphoides 169
Oxyura chrysanthemoides 99
Pachystima myrsinites 47
Pæonia Brownii 30
Palafoxia callosa 94
  Hookeriana 94
  linearis 94
  Texana 94
Papaveraceæ 31
Parietaria debilis 202
  Floridana 202
  Pennsylvanica 203
Parkinsonia aculeata 59
  microphylla 59
Paronychia Jamesii 37
  Lindheimeri 37
  ramosissima 37
Parthenice mollis 86
Parthenium argentatum 86
  Hysterophorus 86
  incanum 86
  ramosissimum 86
Passifloraceæ 67
Passiflora affinis 67
  fœtida 67
  Mexicana 67
  tenuiloba 67
Pavonia Wrightii 39
Pectis angustifolia 73
  Berlandieri 73
  filipes 73
  imberbis 73
  longipes 73
  papposa 73

Page.
Pectis prostrata 73
tenella 73
Pectocarya Chilensis 141
Pedicularis centranthera 120
densiflora 121
grandiflora 120
Peganum Mexicanum 42
Pellæa andromedæfolia 233
atropurpurea 233
flexuosa 233
longimucronata 233
mucronata 233
ornithopus 233
pulchella 233
Wrightiana 233
Pentachæta aurea 81
Pentacrophys Wrightii 170
Pentalophus longiflorus 140
Pentstemon ambiguus 111
antirrhinoides 115
bacharifolius 114
barbatus 114
breviflorus 115
centranthifolius 115
cordifolius 115
cyananthus 114
dasyphyllus 112
digitalis 114
Fendleri 114
gracilis 114
heterophyllus 115
imberbis 114
Jamesii 112
linarioides 112
puniceus 113
spectabilis 113
stenophyllus 112
ternatus 115
Torreyi 114
virgatus 113
Wrightii 113
(Perezia) Thurberi 104
thyrsoidea 104
Wrightii 104
Perezia nana 104
runcinata 104
Pericome caudata 83
Periloma 134
Perityle aglossa 82
coronopifolia 82
Emoryi 82
nuda 82
Parryi 82
Petalonyx 67
Petalostemon candidum 53
emarginatum 53
exile 53
Peteria scoparia 51
Petunia parviflora 155
Peucedanum dasycarpum 70
fœniculaceum 70

Page.
Peucedanum parvifolium 70
Peucephyllum Schottii 74
Phaca Fendleri 56
Crotalariæ 56
canescens 56
Fendleri 56
leucopsis 56
Sonoræ 56
tephiodes 56
triflora 56
Thurberi 56
Phacelia ciliata 145
circinata 143
congesta 143
Douglasii 143
infundibuliformis 144
integrifolia 143
loasæfolia 143
malvæflora 143
micrantha 144
Neomexicana 143
Parryi 144
tanacetifolia 143
tenuifolia 143
viscida 143
Phalangium croceum 220
Pharbitis heterophylla 149
Nil 149
Phaseolus angustissimus 50
atropurpureus 50
macropoides 50
retusus 49
Wrightii 49
Phelipæa comosa 110
Philadelphus serpyllifolius 69
Phlox Drummondii 145
speciosa 145
triovulata 145
Photinia arbutifolia 64
Phyllanthus Carolinianus 193
ericoides 193
polygonoides 193
Rœmerianus 193
Physalis Alkekengi 153
cardiophylla 153
lanceolata 153
lobata 152
longifolia 153
mollis 153
pumila 153
Physostegia Virginiana 134
Phytolaccaceæ 184
Phytolacca decandra 184
Pickeringia montana 51
Pilonophytum capitatum 195
Pilostyles Thurberi 207
Pinaropappus Wrightii 106
Pinus *brachyptera* 209
cembroides 208
Chihuahuana 09
deflexa 209

Page.
Pinus *Edgariana* 209
  edulis 208
  Engelmanni 209
  Fremontiana 208
  insignis 209
  Lambertiana 210
  Llaveana 208
  muricata 209
  ponderosa 209
  radiata 209
  Sabiniana 210
  Torreyana 210
  tuberculata 209
Pistacia Mexicana 44
Pitavia dumosa 43
Pithecolobium brevifolium 62
Plantaginaceæ 109
Plantago *gnaphaloides* 109
  major 109
  Patagonica 109
  Virginica 109
Platanthera dilatata 213
  leucostachys 213
Platanus *Californica* 204
  Mexicana 204
  occidentalis 205
  racemosa 204
Platyloma atropurpurea 233
Platystemon Californicum 31
Platystigma lineare 31
Plectritis congesta 72
Pluchea camphorata 84
  fœtida 84
Plumbaginaceæ 109
Pogogyne Douglasii 129
Polanisia uniglandulosa 35
Polemoniaceæ 145
Polemonium cæruleum 147
Polyanthes Mexicana 215
Polygala hemiptocarpa 49
  macradenia 49
  nutkana 49
  Wrightii 49
  cucullata 49
  Californica 49
Polygalaceæ 48
Polygala alba 48
  Californica 49
  cucullata 49
  hemipterocarpa 49
  Lindheimeri 48
  macradenia 49
  Nutkana 49
  ovatifolia 48
  puberula 48
  scoparia 48
Polygonaceæ 175
Polygonatum biflorum 220
Polygonum acre 178
  amphibium 178
  aviculare 178

Page.
Polygonum camporum 178
  hydropiperoides 178
  hydropiperoides 178
  incarnatum 178
  nodosum 178
  Paronychia 178
  Pennsylvanicum 178
  Persicaria 178
  tenue 178
Polypodium incanum 235
Polypremum procumbens 121
Polystichum munitum 235
Pontederiaceæ 223
Populus angustifolia 204
  balsamifera 204
  monilifera 204
  tremuloides 204
  trichocarpa 204
Porliera angustifolia 42
Porophyllum Greggii 94
  macrocephalum 94
  scoparium 94
Portulacaceæ 37
Portulaca lanceolata 38
  pilosa 38
Potamogeton hybridus 212
  lucens 212
  natans 212
  pauciflorus 212
  pectinatus 212
Potentilla Anserina 64
  glandulosa 64
  paradoxa 64
  Thurberi 64
Prenanthes exigua 107
Primulaceæ 109
Proserpinaca palustris 66
Prunus Capollin 62
  demissa 63
  ilicifolia 63
  minutiflora 62
  subcordata 63
  Virginiana 62
Psathyrotes annua 162
  scaposa 103
Psathyrotes incisa 97
Psilactis asteroides 77
Psilocarphus tenellus 84
Psoralea esculenta 51
  floribunda 51
  macrostachya 51
  orbicularis 51
  psycodes 51
Ptelea angustifolia 44
  trifoliata 43
Pteris aquilina 233
  atropurpurea 233
  lanuginosa 233
  ternifolia 233
Pterostegia drymarioides 177
Ptilocalyx Greggii 136

Page.

- *Ptilomeris anthemoides* 97
- Pyrropappus Carolinianus 106
- *Quamoclidion multiflorum* 169
- Quamoclit coccinea 148
- Quercus acutidens 207
  - agrifolia 206
  - chrysolepis 207
  - *cinerea* 207
  - coccinea 206
  - confertifolia 207
  - *crassipocula* 207
  - dumosa 207
  - Emoryi 207
  - *Fendleri* 206
  - *fulvescens* 207
  - Gambelii 205
  - *grisea* 206
  - *hastata* 206
  - *Hindsii* 205
  - lobata 205
  - *Kelloggii* 205
  - nigra 206
  - oblongifolia 206
  - obtusifolia 206
  - *oxyadenia* 206
  - *pungens* 206
  - *rubra* 205
  - tinctoria 205
  - undulata 206
  - virens 206
- Rafflesiaceæ 207
- Rafinesquia Californica 106
  - Neo-Mexicana 106
- Ranunculaceæ 29
- Ranunculus affinis 29
  - aquatilis 29
  - Californicus 30
  - Cymbalariæ 29
  - *divaricatus* 29
  - hebecarpus 30
  - hydrocharoides 29
  - macranthus 29
  - repens 30
  - trachyspermus 29
- Raphanus Raphanistrum 35
- Resedaceæ 34
- Rhamnaceæ 45
- Rhamnus croceus 46
- Rhus copallina 44
  - diversiloba 44
  - *laurina* 44
  - microphylla 44
  - Toxicodendron 44
  - trilobota 44
  - virens 44
- Rhynchosia menispermoidea 50
  - Texana 50
- Rhytiglossa pedunculosa 124
- Ribes aureum 68
  - Californicum 68
  - divaricatum 68

Page.

- Ribes lepanthum 68
  - malvaceum 68
  - Menziesii 68
  - sanguineum 68
  - speciosum 68
  - *tenuiflorum* 68
- Riddellia arachnoidea 96
  - tagetina 96
- Rivina lævis 184
  - *portulacoides* 184
- Robinia Neo-Mexicana 53
- Romneya Coulteri 31
- Rosa blanda 64
  - gymnocarpa 64
- Rosaceæ 62
- Roulinia *Jacquini* 160
  - unifaria 160
- Rubiaceæ 72
- Rubus Neo-Mexicanus 64
  - Nutkanus 64
  - trivialis 64
  - ursinus 64
- Rudbeckia fulgida 88
- Runex hymenosepalus 177
  - maritimus 178
  - salicifolius 178
- Rutaceæ 42
- *Rutosma Texanum* 42

- Sabbatia campestris 157
- Saggitaria calycina 212
  - longiloba 212
  - simplex 212
- Salazaria Mexicana 133
- Salicaceæ 204
- Salix *lasiandra* 204
  - longifolia 204
  - lucida 204
  - Wrightii 204
- Salicornia Bigelovii 184
  - mucronata 184
- *Salpiglossis prostrata* 155
- Salvia albiflora 131
  - *angustifolia* 131
  - ballotæflora 131
  - *breviflora* 131
  - *cæsia* 131
  - carduacea 132
  - coccinea 132
  - Columbariæ 132
  - farinacea 131
  - *gossypina* 132
  - lanceolata 131
  - *laxa* 131
  - microphylla 131
  - *porphyrata* 132
  - pseudo-coccinea 132
  - Rœmeriana 132
  - spicata 131
  - Texana 132
- Sambucus glauca 71

Page.

- Sambucus Mexicana 71
- Samolus ebracteatus 109
  - *floribundus* 109
  - Valerandi 109
- *Sangre de Drago* 196
- Sanicula arctopoides 70
  - bipinnatifida 70
  - Menziesii 70
  - nudicaulis 70
- Santalaceæ 185
- Sanvitalia Aberti 92
  - tragiæfolia 92
- Sapindaceæ 47
- Sapindus marginatus 47
- Sapium? annuum 201
  - salicifolium 201
  - sylvaticum 201
- Sapotaceæ 109
- Sarcostemma bilobum 160
  - *clausum* 161
  - *cynanchoides* 160
  - elegans 161
  - peterophyllum 161
  - *Texanum* 160
- Sarratia Berlandieri 179
- Sartwellia Flaveriæ 92
- *Sassafras-Laurel* 185
- Saururaceæ 203
- Saxifragaceæ 69
- Saxifraga Parryi 69
  - Virginiensis 69
- Schæfferia cuneifolia 47
- Schaueria linearifolia 123
  - parvifolia 122
- Schinus molle 44
- *Schistophragma pusilla* 117
- Schkuhria Hopkirkia 96
  - Wrightii 96
- Schœnocaulon Drummondii 222
  - *Texanum* 222
- Schœnolirion *album* 220
  - Michauxii 220
- *Schœnus effusus* 229
- Schollera graminifolia 223
- Schrankia uncinata 61
- *Scilla esculenta* 218
  - *Fraseri* 218
- Scirpus *acutus* 228
  - *equisetoides* 228
  - lacustris 228
  - maritimus 229
  - Olneyi 228
  - pungens 228
  - *riparius* 228
  - *rostellatus* 228
  - *subsquarrosus* 229
  - *validus* 228
- *Sclerocarpus exiguus* 101
- *Scleropus* 179
- Screw-bean 60
- Screw mesquit 60

Page.

- Scrophulariaceæ 110
- Scrophularia coccinea 111
- Scutellaria *Drummondii* 133
  - resinosa 133
  - tuberosa 133
- Sedum edule 68
  - spathulæfolium 68
  - Wrightii 68
- Selaginella lepidophylla 236
  - rupestris 236
- Selinocarpus angustifolius 170
  - chenopodioides 170
  - diffusus 168
- Selinocarpus diffusus 168
- Senecio aureus 103
  - canus 103
  - coronopus 103
  - fastigiatus 103
  - filifolius 103
  - lobatus 103
  - longilobus 103
  - multilobatus 103
  - Parryi 103
  - Riddellii 103
  - Tampicanus 103
- Sequoia sempervirens 210
- Serjania incisa 47
- *Serophytum Drummondi* 197
  - *lanceolatum* 197
  - *pilosissimum* 197
- Sesameæ 110
- Sesbania macrocarpa 51
- Sesuvium Portulacastrum 38
- Seutera maritima 164
- Seymeria bipinnatisecta 117
  - *pectinata* 117
  - scabra 118
- Sida Elliottii 39
  - filicaulis 38
  - filipes 38
  - hederacea 38
  - lepidota 39
  - longipes 39
  - malvæflora 38
  - physocalyx 39
- Sidalcea humilis 38
  - malvæflora 38
- *Sieversia paradoxa* 64
- Silene Antirrhina 36
  - Greggii 36
  - pulchra 36
  - quinquevulnera 36
- Silphium scaberrimum 84
- Simarubaceæ 44
- Simmondsia Californica 202
- Simsia calva 89
  - canescens 89
  - exaristata 89
  - frutescens 89
  - scaposa 89

Page.
Siphonoglossa Pilosella 124
Sisymbrium canescens 33
diffusum 33
Sisyrinchium Bermudiana 216
minus 216
Smilaceæ 217
Smilax *Bona-nox* 217
Beyrichii 217
hastata 217
hederæfolia 217
pandurata 217
Sprengelii 217
tamnoides 217
Smilacina racemosa 220
stellata 220
Solanaceæ 151
Solanum *Bejariense* 152
Californicum 151
citrullifolium 152
crenato-dentatum 151
Douglasii 151
elæagnifolium 152
Fendleri 151
flavidum 152
genistoides 151
heterandrum 152
heterodoxum 151
Hindsianum 152
Jamesii 151
Lindhamerianum 152
luteiflorum 151
Menziesii 152
nigrum 152
nodiflorum 151
Rœmerianum 152
rostratum 152
Texense 152
triflorum 151
Solanum *Coronopus* 155
triquebrum 152
umbelliferum 151
verbaseifolium 152
Solidago angusta 79
Californica 79
Canadensis 79
elongata 79
nemoralis 79
occidentalis 79
petiolaris 79
Radula 79
Sonchus asper 107
oleracens 107
Sophora sericca 58
speciosa 58
tomentosa 58
Sotol 221
Spergularia rubra 37
Sphacele calycina 131
Sphæralcea angustifolia 39
Fendleri 39
hastatula 39

Page.
Sphæralcea incana 39
stellata 39
Spilanthes Nuttallii 92
Spiræa ariæfolia 63
cæspitosa 63
Californica 64
dumosa 63
Spraguea umbellata 37
Stachys agraria 134
coccenea 134
palustris 134
umbrosa 134
Statica Limonium 109
Stegnocarpus canescens 136
Stellaria media 37
mœnchoides 37
nitens 37
Stemodia 117
Stenandrium barbatum 122
Stephanomeria minor 105
Thurberi 105
Stevia Berlandieri 73
canescens 73
macella 73
micrantha 73
salicifolia 73
Stillingia sylvatica 201
spinulosa 201
Stiphonia integrifolia 44
serrata 44
Streptanthus arcuatus 33
carinatus 32
glandulosus 33
linearifolius 32
longifolius 33
petiolaris 32
platycarpus 32
Strombocarpa cinerescens 60
pubescens 60
Styloclina micropoides 84
Styraceæ 108
Styrax Californicum 108
Suæda fruticosa 184
maritima 184
Symphoricarpus mollis 71
rotundifolius 71
Synthlipsis Berlandieri 34
Greggii 34

Tagetes micrantha 93
Talinopsis frutescens 37
Talinum aurantiacum 37
parvifolium 37
reflexum 37
Taxodium distichum 210
sempervirens 210
Tecoma stans 110
Telanthera polygonoides 180
Teloxys cornuta 182
Tephrosia leucantha 51
Lindheimeri 51

Page.
Tephrosia tenella 54
Tepopote 208
Tessaria borealis 84
Tetradymia ramosissima 102
Tetramerium *hispidum* 126
nervosum 125
ovatum 126
platystegium 126
polystachyum 126
Teucrium Canadense 135
Cubense 135
laciniatum 135
Thalictrum Fendleri 29
Thamnosma montanum 42
Texanum 42
Thaspium montanum 70
Thelesperma filifolium 90
gracile 90
simplicifolium 90
Thelypodium Wrightii 33
Theophrastaceæ 109
Thermopsis fabacea 58
montana 58
Thlaspi Fendleri 34
Thuja gigantea 211
Thurberia thespesioides 40
Thysanocarpus crenatus 35
elegans 35
laciniatus 35
Tiliaceæ 40
Tillandsia recurvata 215
usneoides 215
Tinantia gypsophiloides 172
Tiquilia brevifolia 136
dichotoma 136
Tithonia tubæformis 89
Tournefortia 139
Townsendia strigosa 78
Wrightii 78
Tradescantia anomala 225
leiandra 224
micrantha 224
rhodantha 225
rosea 226
Virginica 224
Tragia angustifolia 200
betonecæfolia 200
brevispica 200
myricæfolia 201
ramosa 200
scutellariæfolia 201
urens 201
Trianthema monogyna 37
Trichocoronis 73
Trichoptilium incisum 97
Trichostema dichomum 134
lanatum 134
Tridax bicolor 99
procumbens 99
Trifolium *albopurpureum* 54
amplectens 54

Page.
Trifolium Bejariense 54
fucatum 54
fimbriatum 54
heterodon 54
involucratum 54
macræi 54
microcephalum 54
physopetalum 54
spinulosum 54
tridentatum 54
variegatum 54
Trifurcia cærulea 216
Trixis *angustifolia* 104
frutescens 103
Trompillo 152
Tuckermania maritima 92
Turritis macrocarpa 32
patula 32
Typhaceæ 211
Typha latifolia 211
Tyria myricæfolia 201
Ulmus alata 203
crassifolia 203
opaca 203
Umbelliferæ 69
Unguadia speciosa 48
Urticaceæ 202
Urtica gracilis 202
purpurascens 202
urens 202
Urvillea Mexicana 48
Utricularia gibba 110
Vaccinium ovatum 108
Vachellia Lindheimeri 62
Valeriana edulis 72
sylvatica 72
Valerianaceæ 72
Varilla Texana 102
Vauquelinia corymbosa 64
Verbenaceæ 126
Verbena Aubletia 128
bipinnatifida 128
bracteosa 128
canescens 128
hastata 128
officinalis 128
prostrata 128
remota 128
Verbesina podocephala 92
capitaneja 92
Virginica 92
microptera 92
polycephala 92
Vernonia Jamesii 73
Lindheimeri 73
Veronica Anagallis 117
peregrina 117
Vesicaria argyrea 33
densiflora 33
lasiocarpa 34
purpurea 33

Page.
Vesicaria recurvata 33
  stenophylla 33
Vicia exigua 49
  pulchella 49
Vigna villosa 50
  glabra 50
  luteola 50
Viguera cordifolia 89
  laxa 89
  laciniata 89
Villanova chrysanthemoides 96
Viola adunca 35
  cucullata 36
  lobata 35
  longipes 35
  ocellata 35
  pedunculata 35
Violaceæ 35
Vitaceæ 45
Vitis æstivalis 45
  bipinnata 45
  Californica 45
  incisa 45
Waltheria detonsa 40
Wedelia 173
Wedelia hispida 92
Wertgenia hispida 92
  Texana 92
Wissadula mucronulata 39
Wislizena refracta 35
Withania? sordida 155
  coronopus 155
Woodsia obtusa 235
  Perriniana 235

Page.
Woodwardia *Chamissoi* 233
  radicans 233
Xanthisma Texanum 80
Xerophyllum tenax 222
Xymenesia encelioides 92
Yerba de la Golondrina 187
Yerba de San Pedro 152
Yerba Venado 93
Yucca *aloifolia* 221
  angustifolia 220
  baccata 221
  brevifolia 221
  parviflora 221
  puberula 221
  rupicola 221
  tortifolia 221
  Whipplei 222
Zannichellia palustris 212
Zanthoxylum Carolinianum 43
  Pterota 43
Zauschneria Californica 65
Zexmenia brevifolia 92
  Texana 92
Zinnia acerosa 88
  anomala 88
  grandiflora 88
  pumila 88
  tenuiflora 88
Zizyphus lycioides 46
  obtusifolia 46
  Parryi 46
Zornia tetraphylla 56
Zygophyllaceæ 42

DESCRIPTION OF THE PLATES.

PLATE I. CLEMATIS LASIANTHA.—Page 29.

A PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A perfect flower. Fig. 2. A head of carpels on its peduncle; of the natural size.

PLATE II. DELPHINIUM.—Page 30.

UPPER PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A sepal; enlarged. Fig. 2. One of the upper petals; equally enlarged. Fig. 3. One of the lower petals; also enlarged. Fig. 4. A stamen; magnified. Fig. 5. The three pistils; also magnified.

PLATE III. DENDROMEEON RIGIDUM.—Page 32.

A. A FLOWERING PORTION OF THE PLANT. B. A PORTION IN FRUIT.

Fig. 1. A flower bud; magnified. Fig. 2. A stamen; more magnified. Fig. 3. An ovule; still more magnified. Fig. 4. A seed; equally magnified. Fig. 5. The same; longitudinally divided. Fig. 6. The embryo; highly magnified.

PLATE IV. ISOMERIS ARBOREA.—Page 35.

UPPER PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. Plan of the flower. Fig. 2. A flower bud. Fig. 3. An expanded flower. Fig. 4. A petal. Fig. 5. A stamen. Fig. 6. Cross section of the anther. Fig. 7. A flower from which the petals have been removed, showing the torus and its appendages. Fig. 8. Transverse section of the ovary. Fig. 9. A seed, seen in front. Fig. 10. The same; side view. Fig. 11. Longitudinal section of the same. Fig. 12. The embryo. All the figures more or less magnified.

PLATE V. FRANKENIA GRANDIFOLIA.—Page 35.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. A flower. Fig. 2. Transverse section of the calyx. Fig. 3. A flower, with the calyx and part of the petals removed. Fig. 4. A petal, showing the inner side. Fig. 5. A stamen, showing the posterior side. Fig. 6. The pistil. Fig. 7. The ovary, divided longitudinally. Fig. 8. Transverse section of the same. All the figures more or less enlarged.

PLATE VI. THURBERIA THESPESIOIDES.—Page 40.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. A flower, divided longitudinally; the corrolla removed; enlarged. Fig. 2. Transverse section of the ovary; also enlarged. Fig. 3. Fruit of the natural size. Fig. 4. The fruit enlarged and longitudinally divided. Fig. 5. Transverse section of the same. Fig. 6. A seed, longitudinally divided and enlarged. Fig. 7. The embryo.

PLATE VII. LITHRÆA LAURINA.—Page 44.

A. A FLOWERING BRANCH. B. A BRANCH WITH FRUIT: BOTH OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Figs. 2 and 3. These figures are incorrect, as they do not show the disk upon which the petals and stamens are inserted. Fig. 4. The pistil; more magnified. Fig. 5. The same, longitudinally divided. Fig. 6. The ovule; more magnified. Fig. 7. A drupe, with the persistent calyx. Fig. 8. The same, longitudinally divided.

PLATE VIII. HOLACANTHA EMORYI.—Page 45.

Fig. 1. A flowering branch of the sterile plant. Fig. 2. A branch of the fertile plant. Fig. 3. A branch in fruit: all the figures of the natural size. Fig. 4. A flower bud, from the sterile plant. Fig. 5. A sterile flower; and Fig. 6. The same, longitudinally divided. Fig. 7. An inside view of a magnified stamen. Fig. 8. An outside view of the same. Fig. 9. Compound pistil of a fertile flower; magnified. Fig. 10. The same, longitudinally divided and more magnified. Fig. 11. A drupe, magnified; and Fig. 13. The same, longitudinally divided. Fig. 12. The carpophore.

PLATE IX. CEANOTHUS RIGIDUS.—Page 45.

A, A FLOWERING, AND B, A FRUCTIFEROUS, BRANCH, OF THE NATURAL SIZE.

Fig. 1. A flower; magnified. Fig. 2. The pistil; more magnified. Fig. 3. The ovary; still more magnified, and longitudinally divided. Fig. 4. Transverse section of the same. Fig. 5. The persistent base of the calyx.

PLATE X. CEANOTHUS DENTATUS.—Page 46.

A FLOWERING BRANCH, OF THE NATURAL SIZE.

Fig. 1. A flower; magnified. Fig. 2. Petal from a bud. Fig. 3. Stamen, from the same. Fig. 4. Petal and stamen from an open flower. Fig. 5. Pistil and disk; the ovary with three fleshy protuberances at the summit. Fig. 6. Transverse section of the ovary. Fig. 7. Longitudinal section, showing one of the cells laid open, and showing the erect ovule. Fig. 8. A separate ovule. All the figures more or less magnified.

PLATE XI. CEANOTHUS CRASSIFOLIUS.—Page 46.

A FLOWERING BRANCH, OF THE NATURAL SIZE.

Fig. 1. An expanded flower; magnified. Fig. 2. An unexpanded flower; also magnified. Fig. 3. A petal and stamen from the same. Fig. 4. Transverse section of the ovary; more magnified. Fig. 5. Portion of the ovary; more highly magnified; showing one of the cells with its contained ovule.

PLATE XII. POLYGALA NUTKANA.—Page 49.

A PLANT OF THE NATURAL SIZE.

Fig. 1. A flower laid open; moderately enlarged. Fig. 2. Sepals; *a*, the upper odd one; *b*, a lateral upper one; *c*, a wing. Fig. 3. Corolla laid open, showing the stamens; magnified. Fig. 4. An anther, considerably more enlarged. Fig. 5. The pistil; magnified. Fig. 6. A capsule divided longitudinally, showing the pendulous seeds, considerably magnified. Fig. 7. Transverse section of the same. Fig. 8. A seed; more highly magnified.

PLATE XIII. KRAMERIA CANESCENS.—Page 49.

A PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. Plan of the flower. Fig. 2. A flower bud and bracteoles; somewhat enlarged. Fig. 3. An expanded flower; more enlarged. Fig. 4. The three upper petals. Fig. 5. The two lower fleshy and glandular petals; one an inside view, the other an outside view; the last two figures considerably magnified. Figs. 6–8. Different magnified views of a stamen, (fig. 6 shows the vertical opening.) Fig. 9. The pistil; moderately enlarged. Fig. 10. The same considerably magnified and divided longitudinally. Fig. 11. Transverse section of the same. Fig. 12. The ovules, or rather young seeds detached. Fig. 13. A seed; considerably magnified. Fig. 14. A fruit of the natural size. Fig. 15. The upper part of one of the barbed prickles of the fruit pretty highly magnified.

PLATE XIV. PICKERINGIA MONTANA.—Page 51.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. The vexillum. Fig. 2. One of the wings. Fig. 3. A keel-petal. Fig. 4. A flower with part of the calyx and the corolla cut away. The preceding figures moderately enlarged. Fig. 5. Part of a stamen; considerably magnified. Fig. 6. The pistil, equally maginfied, and the ovary longitudinally divided. Fig. 7. An immature seed; more highly magnified.

PLATE XV. HOSACKIA GRACILIS.—Page 54.

A PLANT OF THE NATURAL SIZE, IN FLOWER AND FRUIT.

Fig. 1. A flower somewhat enlarged. Fig. 2. Separate petals; magnified; *a*, the vexillum; *b*, one of the wings; *c*, one of the keel petals. Fig. 3. A seed; considerably magnified.

PLATE XVI. ASTRAGALUS (PHACA) LEUCOPSIS.—Page 56.

A. UPPER PART OF THE PLANT OF THE NATURAL SIZE. B. A PEDUNCLE BEARING MATURE PODS.

Fig. 1. A flower with the petals removed; moderately enlarged. Fig. 2. Separate petals; *a*, the vexillum; *b*, one of the wings; *c*, the keel. Fig. 3. The stamens and pistil; more magnified. Fig. 4. The pistil with its stipe; equally magnified. Fig. 5. The ovary laid open; more magnified. Fig. 6. A very young seed; considerably magnified. Fig. 7. Transverse section of a pod, of the natural size. Fig. 8. A seed; considerably magnified.

PLATE XVII. ASTRAGALUS CROTALARIÆ.[1]—Page 56.

A. UPPER PART OF THE PLANT. B. A RACEME OF PODS: BOTH OF THE NATURAL SIZE.

Fig. 1. A separate flower; moderately enlarged. Fig. 2. The keel; more enlarged. Fig. 3. The stamens, with the pistil enclosed in the sheath of filament; equally magnified. Fig. 4. The pistil detached. Fig. 5. An ovule; pretty highly magnified.

PLATE XVIII. CHÆTOCALYX SCHOTTII.—Page —.

A FLOWERING BRANCH OF THE NATURAL SIZE.

Fig. 1. The petals separated; *a*, the vexillum; *bb*, the wings; *c*, the keel; moderately magnified. Fig. 2. Lower portion of a wing; more magnified. Fig. 3. The monadelphous stamens and the exserted style; still more magnified. Fig. 4. Pistil with the cavity of the ovary laid open; equally magnified. Fig. 5. Flower from which the corolla has fallen; less magnified. Fig. 6. Immature pod, showing the wing-like termination; moderately enlarged. Figs. 7 and 8. Pods of C. Wislizeni, of the natural size. Fig. 9. A seed of the natural size. Fig. 10. The embryo detached and magnified.

PLATE XIX. ACÆNA PINNATIFIDA.—Page 63.

A PLANT OF THE NATURAL SIZE.

Fig. 1. An expanded flower; considerably magnified. Fig. 2. The calyx, shown separately and equally magnified. Fig. 3. Part of a stamen; more magnified. Fig. 4. A flower divided longitudinally, considerably magnified. Fig. 5. The pistil detached and equally magnified. Fig. 6. An ovule.

PLATE XX. ADENOSTOMA SPARSIFOLIA.—Page 63.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. A flower with bracts at the base of the calyx; magnified. Fig. 2. The same with the bracts cut away. Fig. 3. A portion of the flower, more magnified; showing a petal and three stamens. Fig. 4. The pistil; equally magnified. Fig. 5. The ovary of the same laid open, and exposing one of the ovules. Fig. 6. Transverse section of the ovary. Fig. 7. Fructiferous calyx, with the persistent filaments, magnified. Fig. 8. The fruit detached from the same.

PLATE XXI. ROSA GYMNOSPERMA.—Page —.

A FLOWERING BRANCH OF THE NATURAL SIZE.

Fig. 1. A petal; enlarged. Fig. 2. A stamen; considerably magnified. Fig. 3. Longitudinal section of a flower, showing the pistils in the ventricose calyx-tube; the petals removed; enlarged. Fig. 4. A detached pistil; more enlarged. Fig. 5. Longitudinal section of the ovary; magnified. Fig. 6. Cross section of the same; equally magnified.

---

[1] Incorrectly named Astragalus crotalarioides on the plate.

PLATE XXII. PETALONYX THURBERI.—Page 67.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. Hairs of the leaves and stem; highly magnified. Fig. 2. An expanded flower, with its bract and bracteoles; considerably magnified. Fig. 3. The same, with the petals and stamens removed; more magnified. Fig. 4. A petal; equally magnified. Fig. 5. Part of a stamen. Fig. 6. Longitudinal section of the ovary. Fig. 7. The fruit. Fig. 8. Longitudinal section of the same; the last four figures considerably magnified.

PLATE XXIII. RIBES MENZIESII.—Page 68.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. A flower, with the calyx and corolla longitudinally divided; enlarged. Fig. 2. Limb of a petal; considerably magnified. Fig. 3. A stamen; the lower part of the filament cut off; equally magnified. Fig. 4. Transverse section of the ovary; enlarged. Fig. 5. An ovule detached; magnified.

PLATE XXIV. ECHEVERIA LANCEOLATA.—Page 69.

A PLANT OF THE NATURAL SIZE, (WITHOUT THE ROOT.)

Fig. 1. A flower; enlarged. Fig. 2. A portion of the flower laid open; more enlarged. Fig. 3. The pistils; magnified. Fig. 4. One of the pistils, considerably magnified and divided longitudinally. Fig. 5. Transverse section of the same. Fig. 6. A detached ovule highly magnified. Fig. 7. A ripe carpel; magnified.

PLATE XXV. SAXIFRAGA PARRYI.—Page 69.

AN ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. Inside view of a portion of a flower; more enlarged. Fig. 3. A petal and stamen, showing their insertion on the calyx; still more enlarged. Fig. 4. The ovary; considerably magnified. Fig. 5. Transverse section of the ovary; more magnified. Fig. 6. Fructiferous calyx; enlarged. Fig. 7. A seed; pretty highly magnified. Fig. 8. The same longitudinally divided. Fig. 9. A transverse section of the same. Fig. 10. The embryo detached and more highly magnified.

PLATE XXVI. DEWEYA ARGUTA.—Page 70.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. Fruit, moderately enlarged. Fig. 2. Upper portion of the same, considerably magnified. Fig. 3. Transverse section of the same, and the position of the petals indicated.

PLATE XXVII. EURYPTERA LUCIDA.—Page 70.

ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. A petal; more enlarged. Fig. 3. The fruit; enlarged. Fig. 4. Transverse section of the same; considerably magnified. Fig. 5. Longitudinal section

of a carpel in the direction of the shorter diameter; magnified. Fig. 6. The embryo detached and highly magnified.

PLATE XXVIII. APIASTRUM ANGUSTIFOLIUM.—Page 71.

AN ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; magnified. Fig. 2. A petal, (incorrectly drawn.) Fig. 3. A stamen; more magnified. Fig. 4. A fruit; pretty highly magnified. Fig. 5. The carpophore, with one of the carpels attached. Fig. 6. Transverse section of the fruit; highly magnified. Fig. 7. A seed; and Fig. 8, the nucleus detached; much magnified.

PLATE XXIX. LONICERA SUBSPICATA.—Page 71.

PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. A berry; equally enlarged.

PLATE XXX. DICORIA CANESCENS.—Page 87.

PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A staminate flower; considerably magnified. Fig. 2. The same, with the corolla laid open, showing the monadelphous filaments deprived of their anthers. Fig. 3. A grain of pollen; highly magnified. Fig. 4. Abortive style of the staminate flower. Fig. 5. A head of flowers; the two large interior involucral scales nearly concealing the flowers; enlarged. Fig. 6. A ripe achenium; more enlarged. Fig. 7. One of the scales of the receptacle; magnified.

PLATE XXXI. TUCKERMANIA MARITIMA.—Page 92.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A ray-flower; enlarged. Fig. 2. A disk-flower; also enlarged. Fig. 3. Two of the stamens, their filaments united by one edge; more highly magnified. Fig. 4. The pistil; equally magnified. Fig. 5. An achenium; enlarged. Fig. 6. Cross section of the same; more enlarged.

PLATE XXXII. ACARPHÆA ARTEMISRÆFOLIA.—Page 95.

THE ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; magnified.

PLATE XXXIII. ACTINOLEPIS MULTICAULIS.—Page 96.

AN ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. A ray-flower; magnified. Fig. 2. A disk-flower; also magnified.

PLATE XXXIV. RAFINESQUIA CALIFORNICA.—Page 106.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. Grains of pollen; highly magnified. Fig. 3. Achenia; magnified; *a*, an interior one; *b*, an exterior one.

PLATE XXXV. NEMACLADUS RAMOSISSIMUS.—Page 108.

A. A YOUNG PLANT WITH RADICAL LEAVES. B. A FULL GROWN PLANT IN FRUIT: BOTH OF THE NATURAL SIZE.

Fig. 1. A flower; considerably magnified. Fig. 2. Another view of a flower. (I have not verified the correctness of this figure.) Fig. 3. A petal; more magnified. Fig. 4. The stamineal column; equally magnified. Fig. 5. Part of a stamen; more magnified. Fig. 6. Stigma and part of the style; highly magnified. Fig. 7. Cross section of a capsule; considerably magnified. Fig. 8. A seed; highly magnified.

PLATE XXXVI. EMORYA SUAVEOLENS.—Page 121.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. The calyx; magnified. Fig. 2. The corolla; equally magnified. Fig. 3. The same, laid open, showing the insertion of the stamens and the pistil; more magnified. *3a*, anther and portion of the filament; more highly magnified. Fig. 4. Capsule; also magnified. Fig. 5. Transverse section of the same. Fig. 6. A seed; highly magnified. Fig. 7. The embryo; separated and still more highly magnified. Fig. 8. Plan of the flower.

PLATE XXXVII. SPHACELE CALYCINA.—Page 131.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. The corolla, laid open, showing the stamens and pistil. Fig. 2. The 4-lobed ovary, gynophore, and lower part of the style.

PLATE XXXVIII. AUDIBERTIA GRANDIFLORA.—Page 132.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. The corolla, laid open and more enlarged.

PLATE XXXIX. SALAZARIA MEXICANA.—Page 133.

A PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. The corolla, laid open, showing the stamens and pistil. Fig. 3. One of the superior stamens; magnified. Fig. 4. The inflated fructiferous calyx; magnified. Fig. 5. A nutlet; considerably magnified. Fig. 6. The same, longitudinally divided.

PLATE XL. TRICHOSTEMA LANATUM.—Page 134.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. The corolla, laid open and more enlarged.

PLATE XLI. TETRACLEA COULTERI.—Page 134.

A PLANT OF THE NATURAL SIZE.

Fig. 1. The corolla laid open; enlarged. Fig. 2. The pistil; equally enlarged. Fig. 3. The ovary; more enlarged. Fig. 4. Transverse section of the same; still more enlarged. Fig.

5. A seed; magnified. Fig. 6. The fruit and fructiferous calyx; one of the nutlets removed; magnified. Fig. 7. Inside view of a nutlet; equally magnified. Fig. 8. Transverse section of a nutlet; back view. Fig. 9. Longitudinal section of the same. Fig. 10. The embryo; equally magnified.

PLATE XLII. ERYTHRÆA CHIRONIOIDES.—Page 156.

AN ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. One of the divisions of the calyx; magnified. Fig. 3. Calyx and fruit; magnified. Fig. 4. A seed; more highly magnified.

PLATE XLIII. ECHITES MACROSIPHON.—Page 158.

A PLANT OF THE NATURAL SIZE.

Fig. 1. A flower, with the narrow portion of the tube and the calyx cut away, and the upper part laid open; enlarged. Fig. 2. A stamen; magnified. Fig. 3. The stigma, with an anther adhering to it; equally magnified. Fig. 4. Longitudinal section of the ovaries; also magnified. Fig. 5. A placenta, with the ovules attached. Fig. 6. A seed with its tuft of hairs at the summit; magnified.

PLATE XLIV. ACERATES TOMENTOSA*.—Page 160.

UPPER PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. One of the pollen masses suspended from a gland of the stigma; considerably magnified. Fig. 3. A pod of the natural size.

PLATE XLV. A. ASCLEPIAS NUMMULARIA.—Page 163.

A PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. One of the hoods; magnified. Fig. 3. The same, laid open and showing the horn. Fig. 4. An anther, inside view; considerably magnified. Fig. 5. A pair of pollen masses attached to a gland of the stigma; more highly magnified. Fig. 6. A pod of the natural size.

PLATE XLV. B. ASCLEPIAS MACROTIS.—Page 164.

A PLANT OF THE NATURAL SIZE.

Fig. 1. A flower; enlarged. Fig. 2. One of the hoods; magnified. Fig. 3. The same laid open. Fig. 4. An anther, seen from the inside; considerably magnified. Fig. 5. A pair of pollen masses; more highly magnified.

PLATE XLVI. ACLEISANTHES LONGIFLORA.—Page 170.

A PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. Upper part of the perianth laid open. Fig. 2. Lower portion of the same. Fig. 3. A stamen; magnified. Fig. 4. The ovary laid open; magnified. Fig. 5. The fruit; enlarged.

---

* Incorrectly named Asclepias in the plate.

Fig. 6. Transverse section of the same; more enlarged. Fig. 7. The embryo detached. Fig. 8. Side view of the same.

PLATE XLVII. A. SELINOCARPUS ANGUSTIFOLIUS.—Page 170.

AN ENTIRE PLANT OF THE NATURAL SIZE.

Fig. 1. The perianth laid open; enlarged. Fig. 2. The fruit; also enlarged. Fig. 3. Longitudinal section of the same. Fig. 4. Transverse section of the same; more enlarged. Fig. 5. The embryo detached; equally magnified. Fig. 6. Side view of the same.

PLATE XLVII. B. PENTACROPHYS WRIGHTII.—Page 170.

A PORTION OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A transversely divided fruit from a precociously fructified unexpanded flower; enlarged. Fig. 2. A fruit from an expanded flower; equally enlarged. Fig. 3. The same; of the natural size.

PLATE XLVIII. MIRABILIS CALIFORNICA.—Page. 169.

UPPER PART OF THE PLANT OF THE NATURAL SIZE.

Fig. 1. A flower, with its involucre; enlarged. Fig. 2. The same, laid open. Fig. 3. A fruit, about four times the natural size.

PLATE XLIX. SIMMONDSIA CALIFORNICA.—Page 202.

A. A FLOWERING BRANCH OF THE MALE PLANT. B. A BRANCH OF THE FEMALE PLANT.

Fig. 1. A male flower; enlarged. Fig. 3. The same, with the stamens removed. Fig. 2. An anther; more enlarged. Fig. 4. The ovary; magnified and longitudinally divided. Fig. 5. An ovule, more highly magnified. Fig. 6. Longitudinal section of the same. Fig. 7. A seed, somewhat enlarged. Fig. 8. Longitudinal section of the same. Fig. 9. Transverse section of the same.

PLATE L. CELTIS PALLIDA.[1]—Page 203.

A. A FLOWERING BRANCH OF THE NATURAL SIZE. B. A FRUCTIFEROUS BRANCH.

Fig. 1. Plan of the flower. Fig. 2. An expanded sterile flower; magnified. Fig. 3. A stamen from the same. Fig. 4. A cluster of flowers, the terminal perfect; magnified. Fig. 5. Pistil, with the ovary longitudinally divided. Fig. 6. A droop, with the upper half of the sarcocorp cut away; enlarged. Fig. 7. Transverse section of a seed. Fig. 8. The embryo detached.

PLATE LI. QUERCUS ACUTIDENS.—Page 207.

A BRANCH WITH FRUIT; OF THE NATURAL SIZE.

PLATE LII. PILOSTYLES THURBERI.—Page —.

THE PLANTS, CONSISTING OF SINGLE FLOWERS, PARASITIC ON DALEA SCHOTTII.

Fig. 1. Magnified longitudinal section of a branch of the Dalea, showing the mode of attachment of the parasite. Fig. 2. A fertile flower; magnified. Fig. 3. Transverse section of the

same. Fig. 4. Longitudinal section of the same. Fig. 5. An ovule detached and highly magnified.

---

[1] Named *C. cinerea* on the plate.

PLATE LIII. PINUS LLAVEANA.—Page 208.

A BRANCH OF THE NATURAL SIZE.

Fig. 1. A mature cone. Fig. 2. The same, with the scales expanded. Fig. 3. A seed: all the figures of the natural size.

PLATE LIV. PINUS MURICATA.[2]—Page 209.

A. A BRANCH WITH STAMINATE CATKINS OF THE NATURAL SIZE.
B. A CONE OF THE NATURAL SIZE.

PLATE LV. PINUS INSIGNIS.—Page. 209.

A. A BRANCH OF THE NATURAL SIZE.
B. A CONE OF THE NATURAL SIZE.

PLATE LVI. PINUS DEFLEXA.—Page 209.

LEAVES OF THE NATURAL SIZE.

Fig. 1. A cone. Fig. 2. A seed; both of the natural size.

PLATE LVII. PINUS SABINIANA.—210.

A BRANCH WITH LEAVES, AND A CONE OF THE NATURAL SIZE.

PLATES LVIII AND LIX. PINUS TORREYANA.—Page. 210.

A BRANCH WITH LEAVES, AND A CONE OF THE NATURAL SIZE.

PLATE LX. CHLOROGALUM POMERIDIANUM.—Page ——.

UPPER AND LOWER PORTION OF THE PLANT, OF THE NATURAL SIZE.

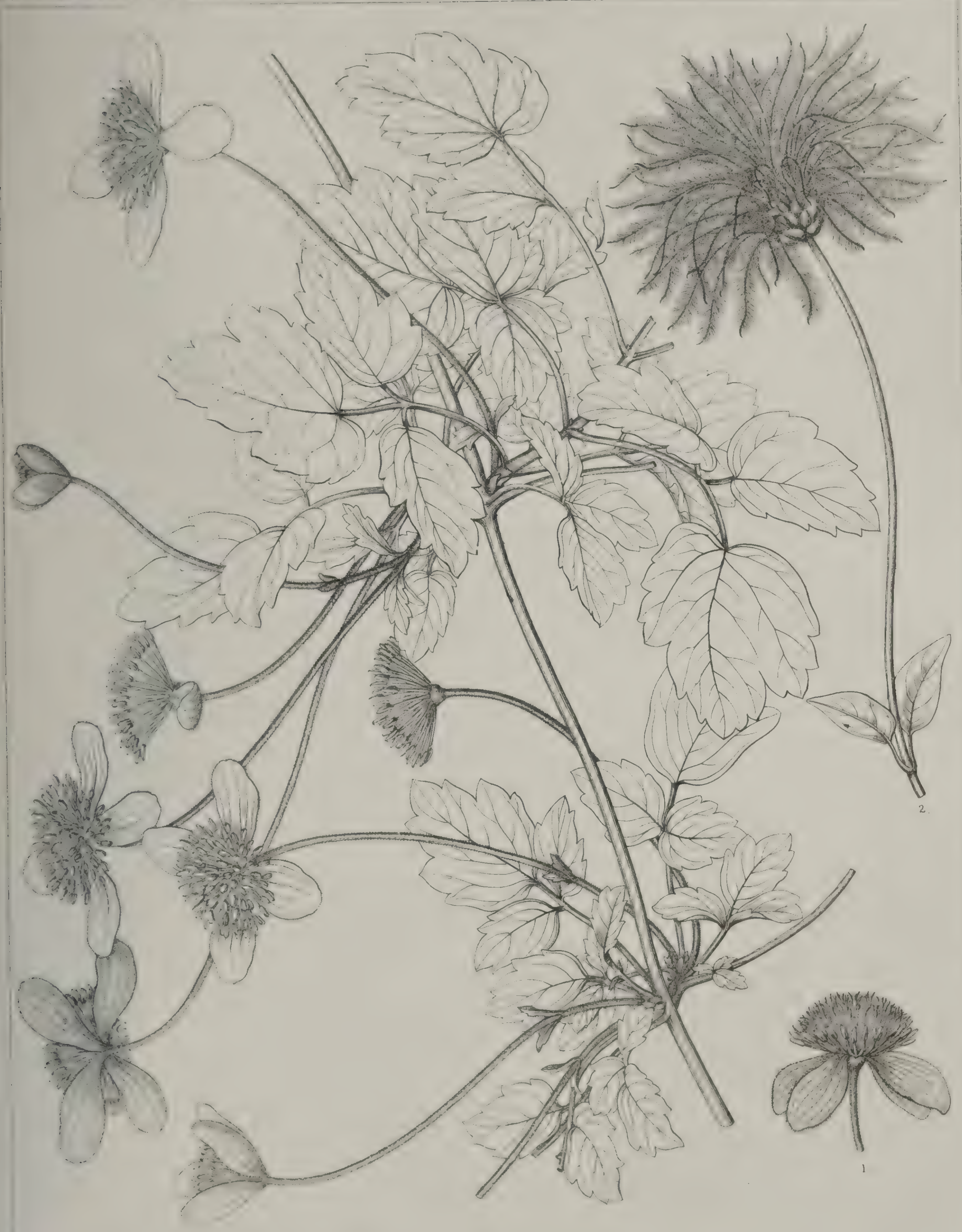
Fig. 1. A sepal and stamen; enlarged. Fig. 2. Transverse section of the ovary; magnified. Fig. 3. An ovule; highly magnified.

PLATE LXI. FRITILLARIA LANCEOLATE.—Page ——.

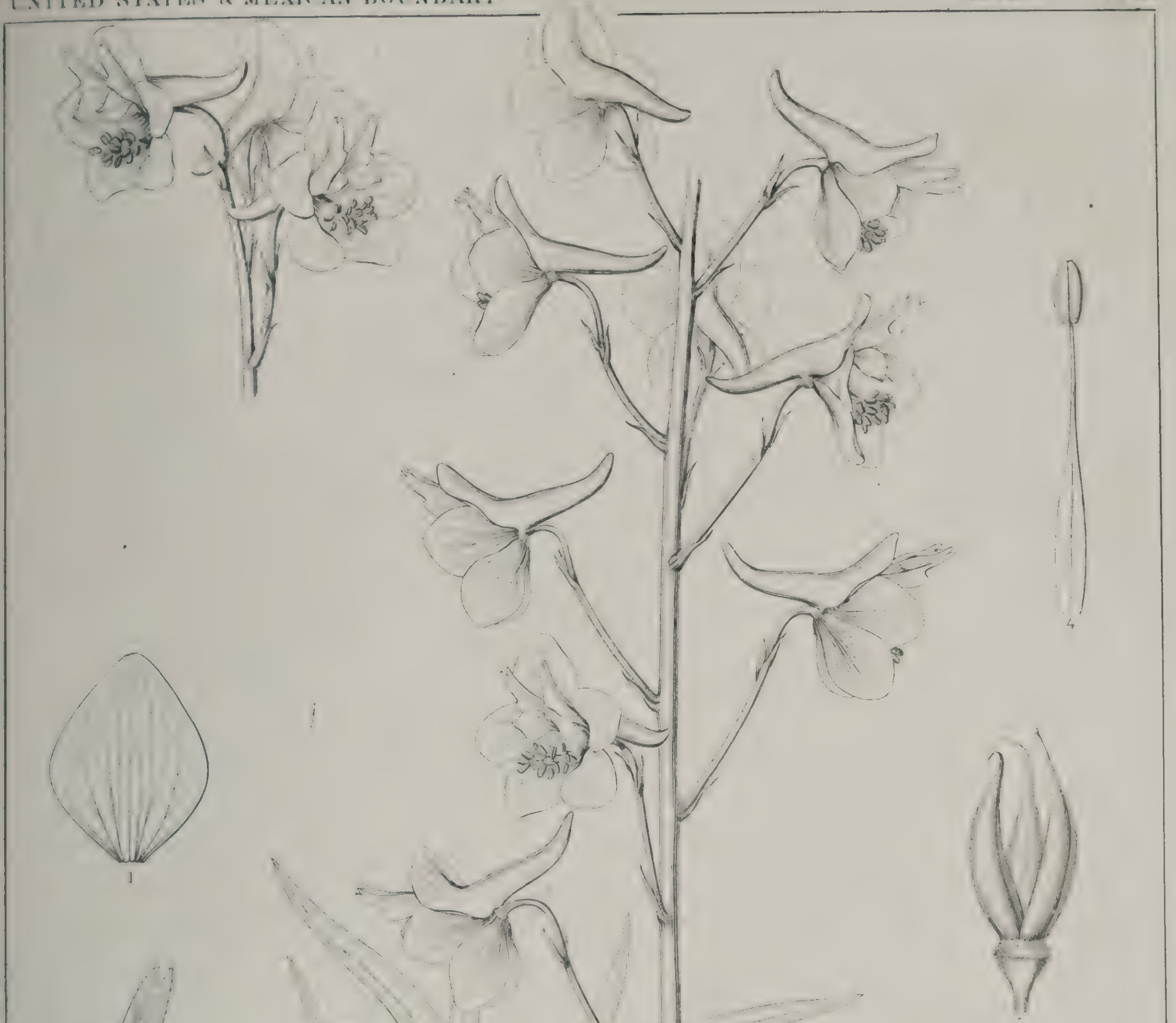
A AND B. BROAD AND NARROW LEAVED FORMS OF THE PLANT, OF THE NATURAL SIZE.

Fig. 1. An exterior sepal; enlarged. Fig. 2. An interior sepal; equally enlarged. Fig. 3. A stamen; magnified.

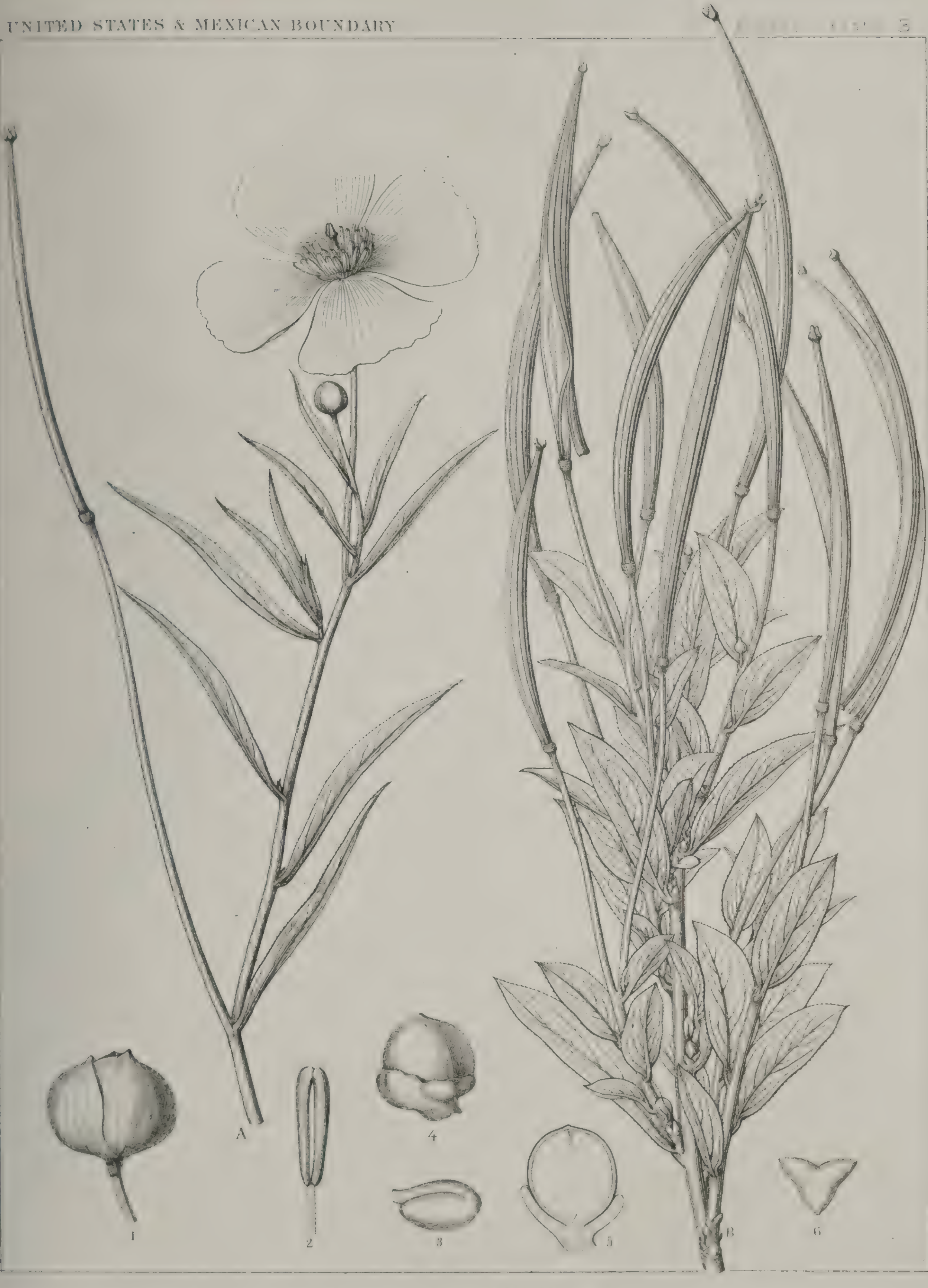
[2] Named *P. edgariana* on the plate.



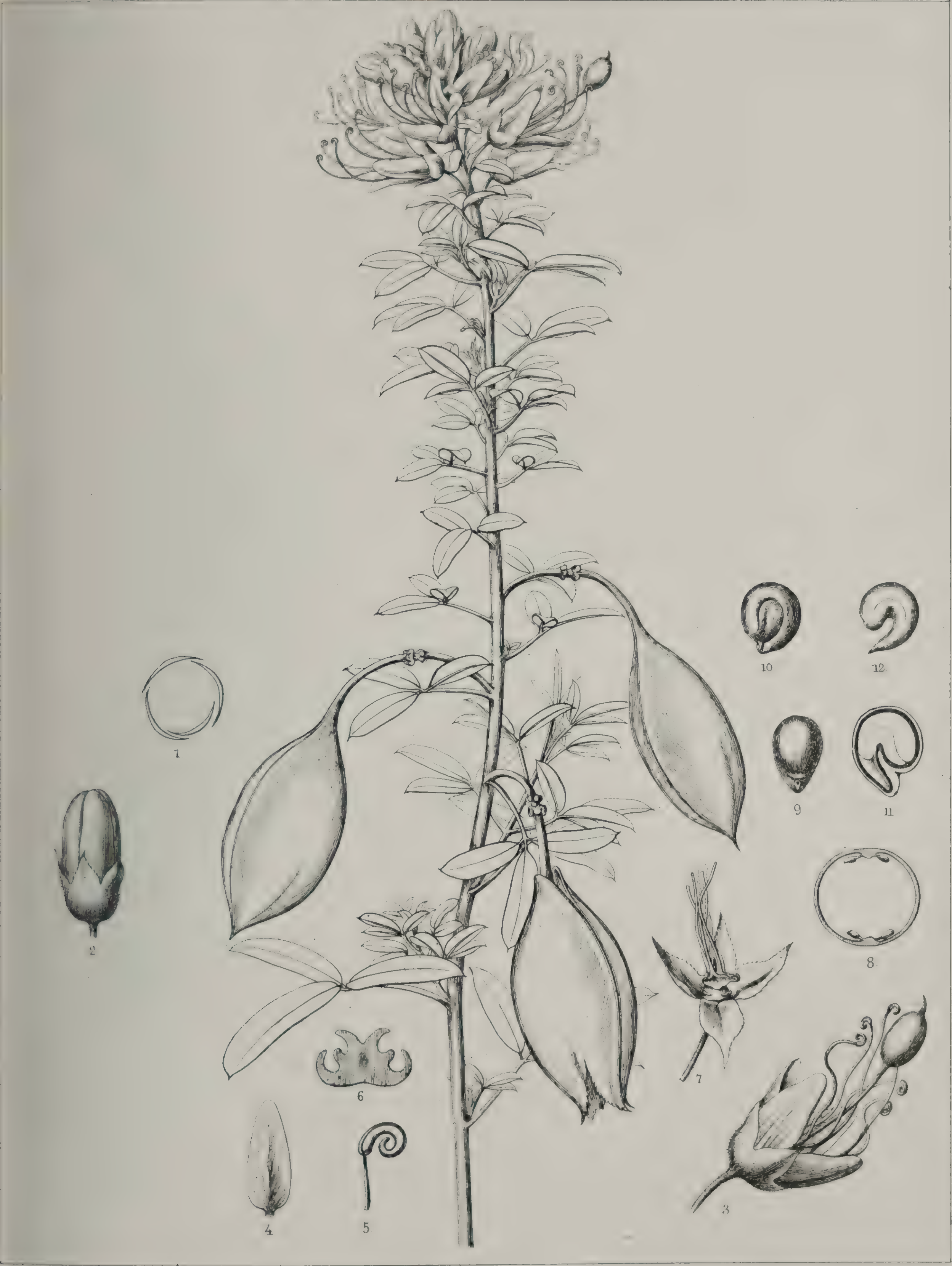
CLEMATIS LASIANTHA



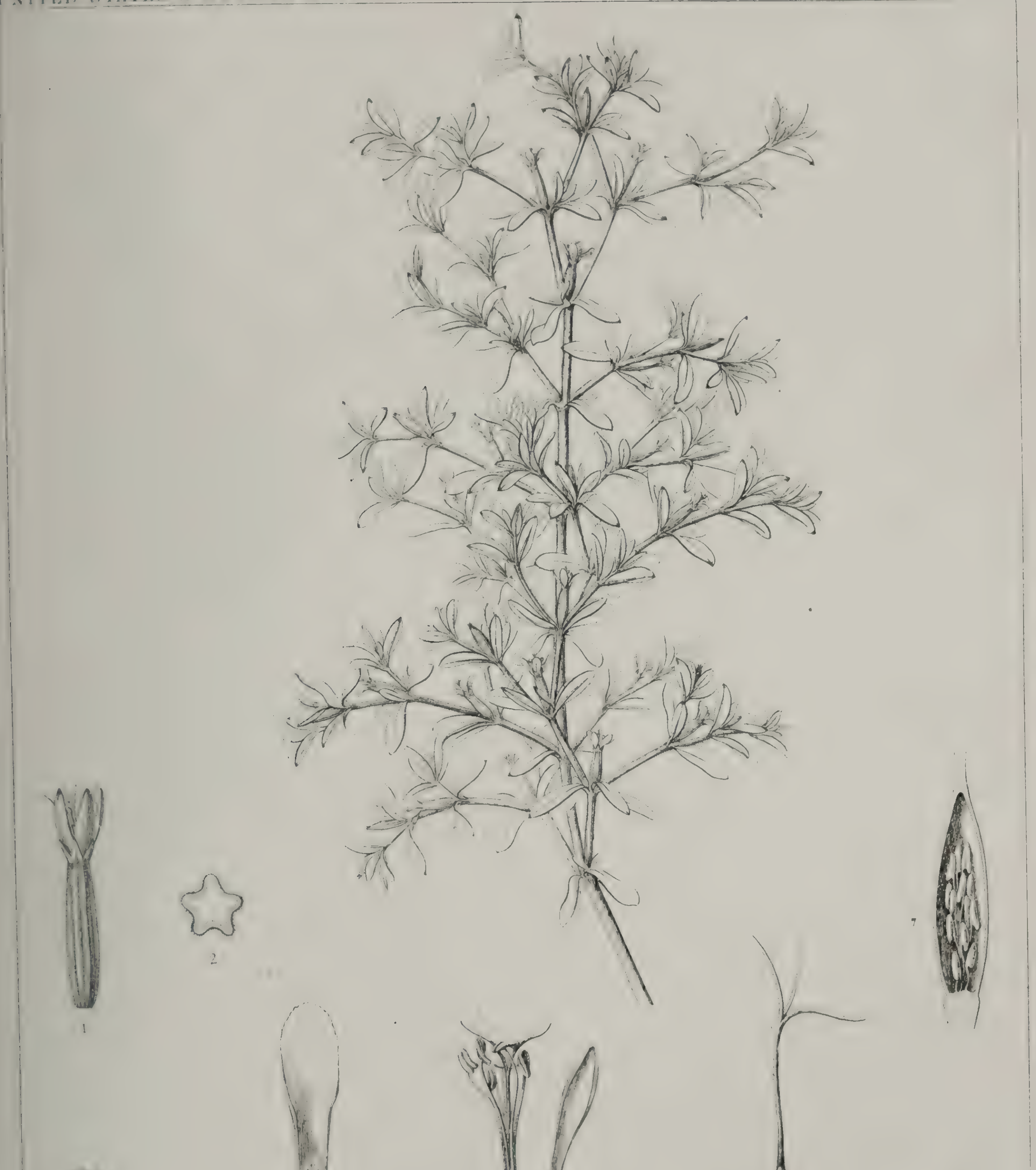
DELPHINIUM CARDINALE



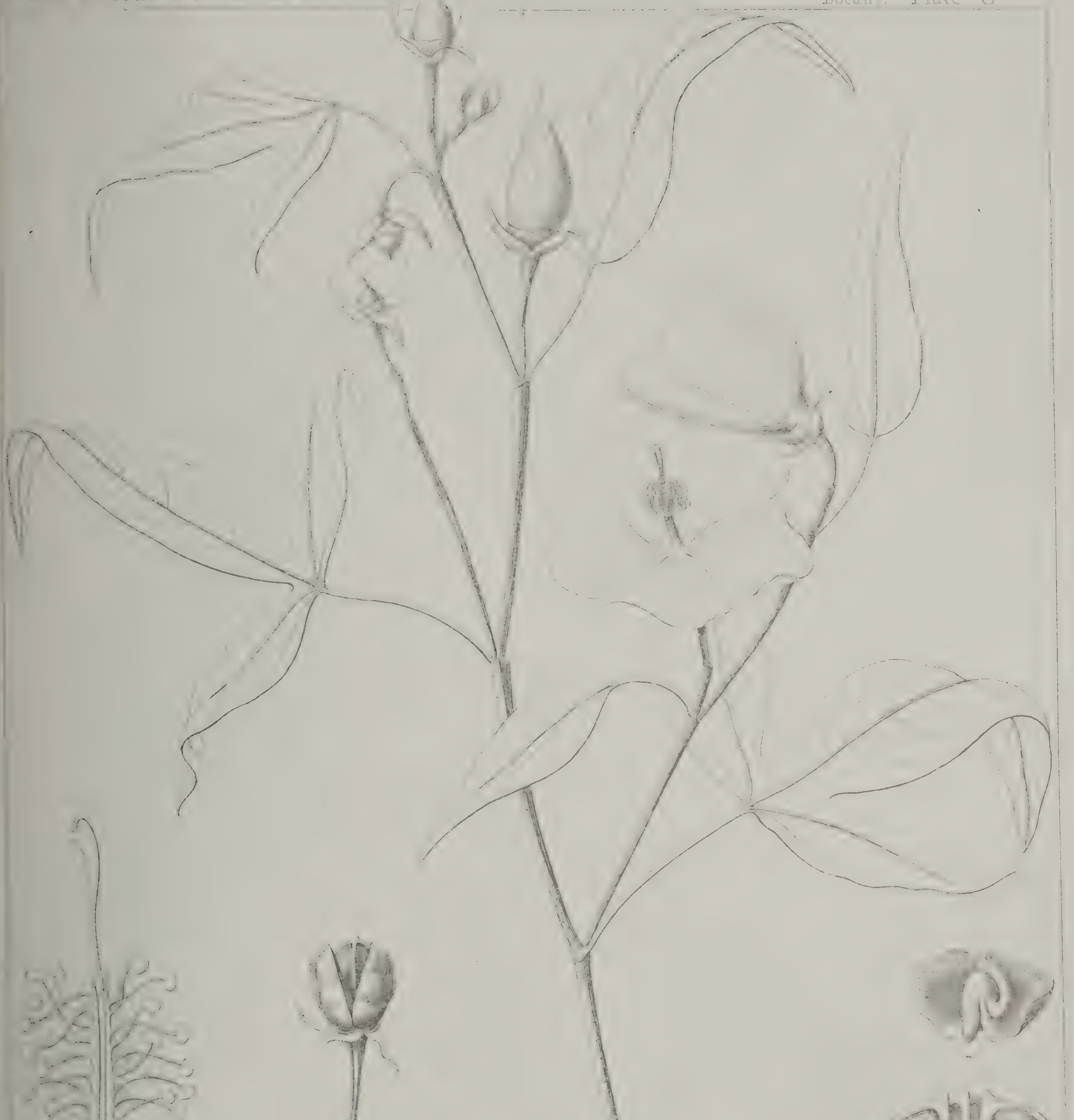
DENDROMECON RIGIDUM



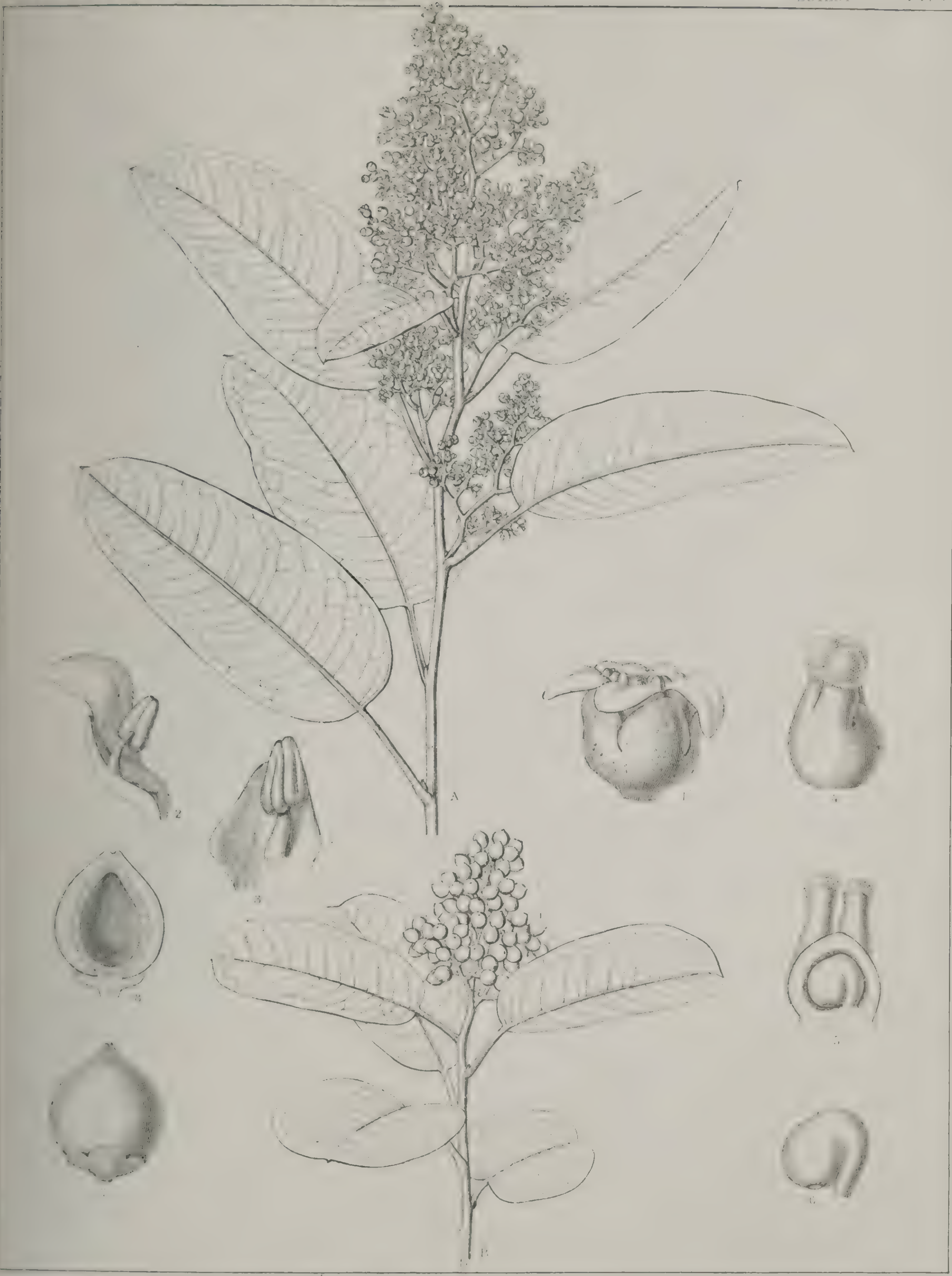
ISOMERIS ARBOREA.



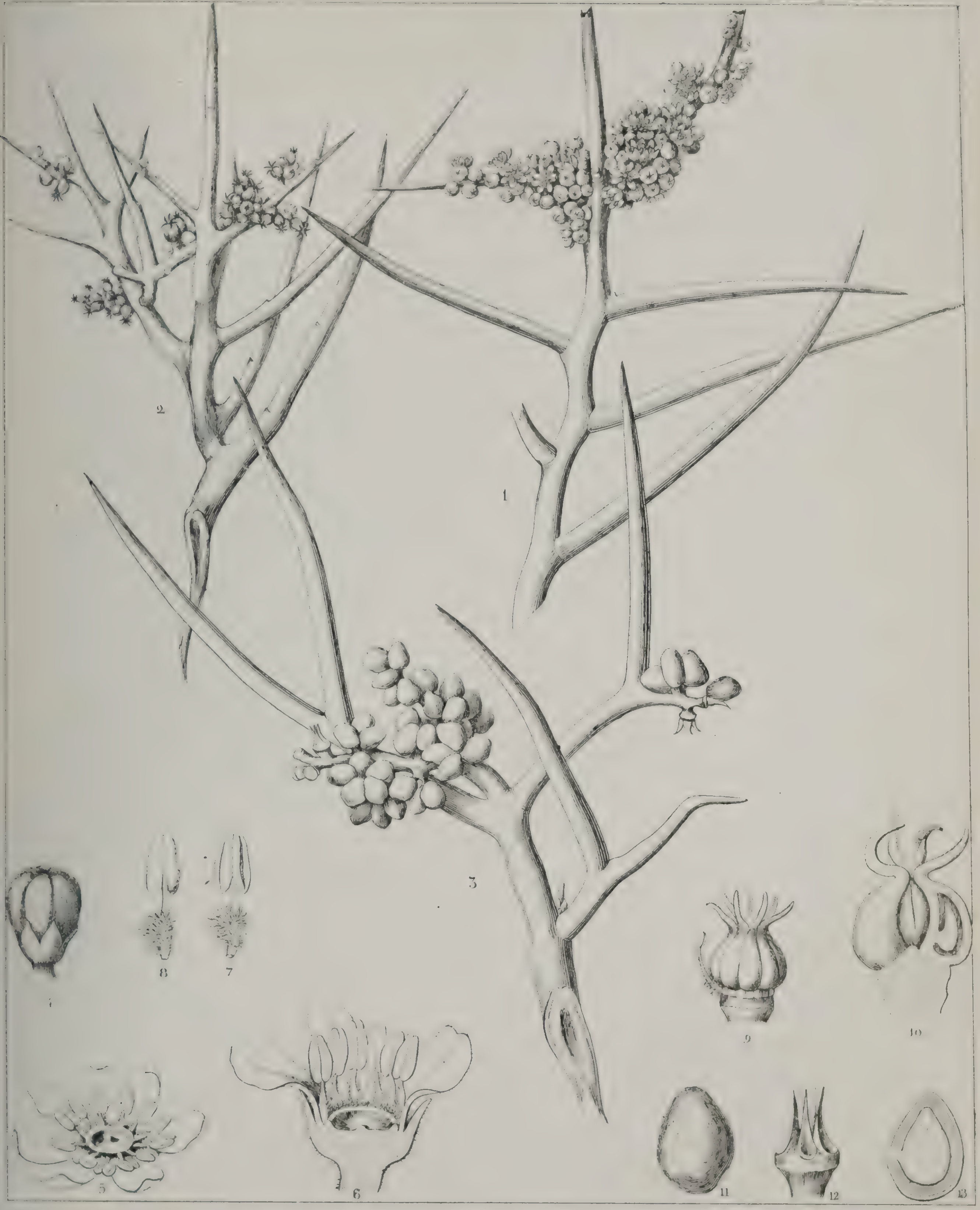
FRANKENIA GRANDIFOLIA



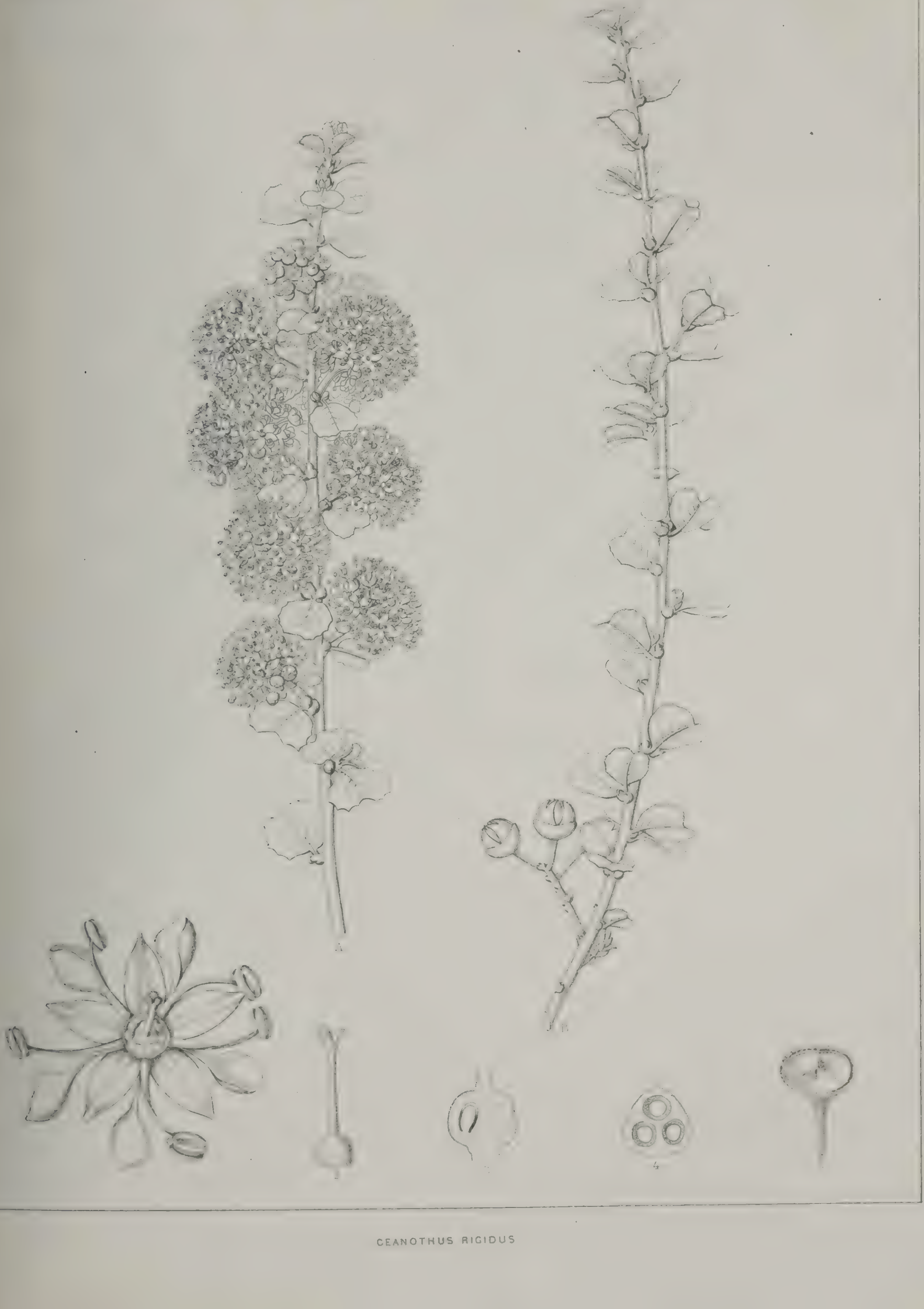
THURBERIA THESPESIODES.



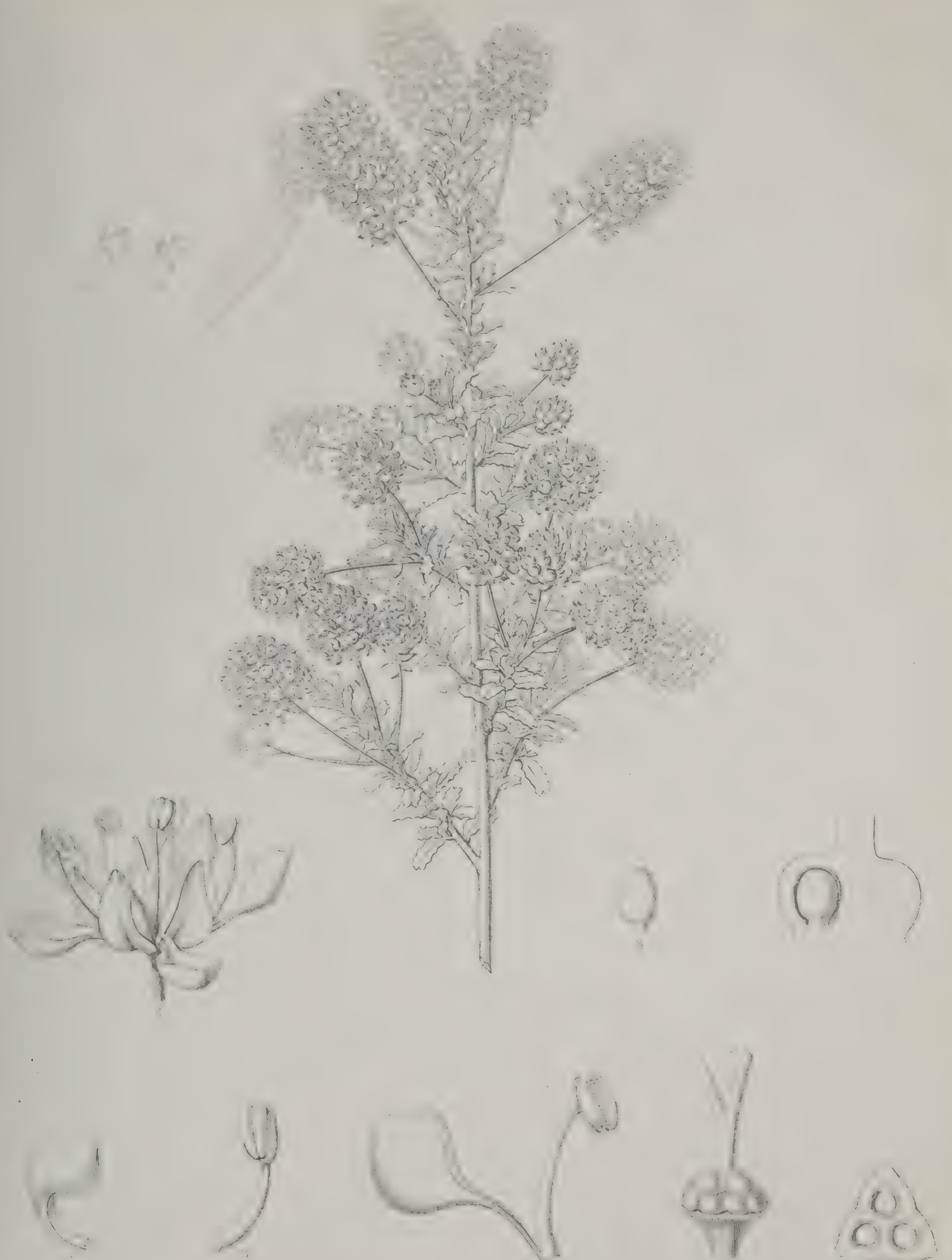
LITHRÆA LAURINA



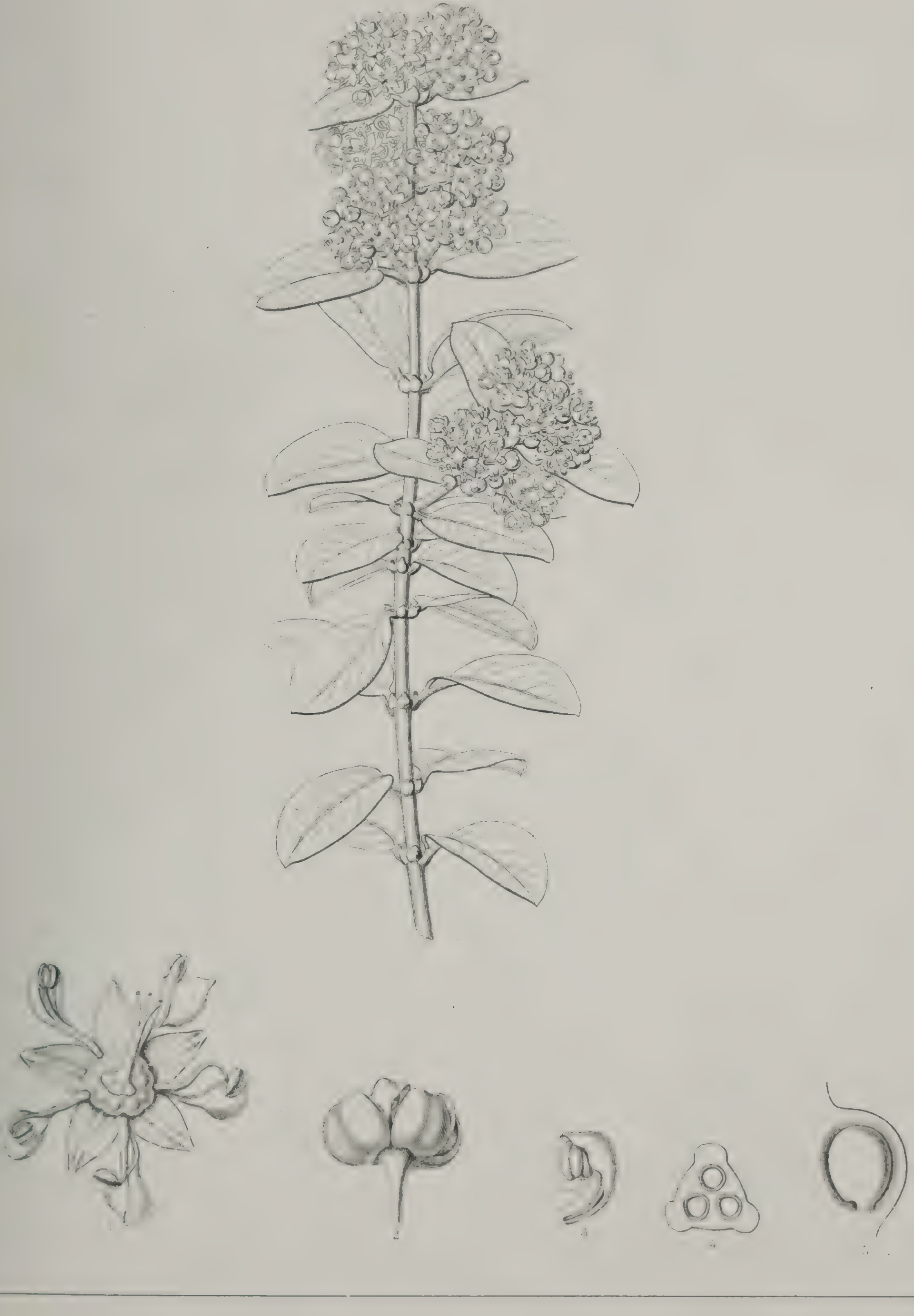
HOLACANTHA EMORYI.



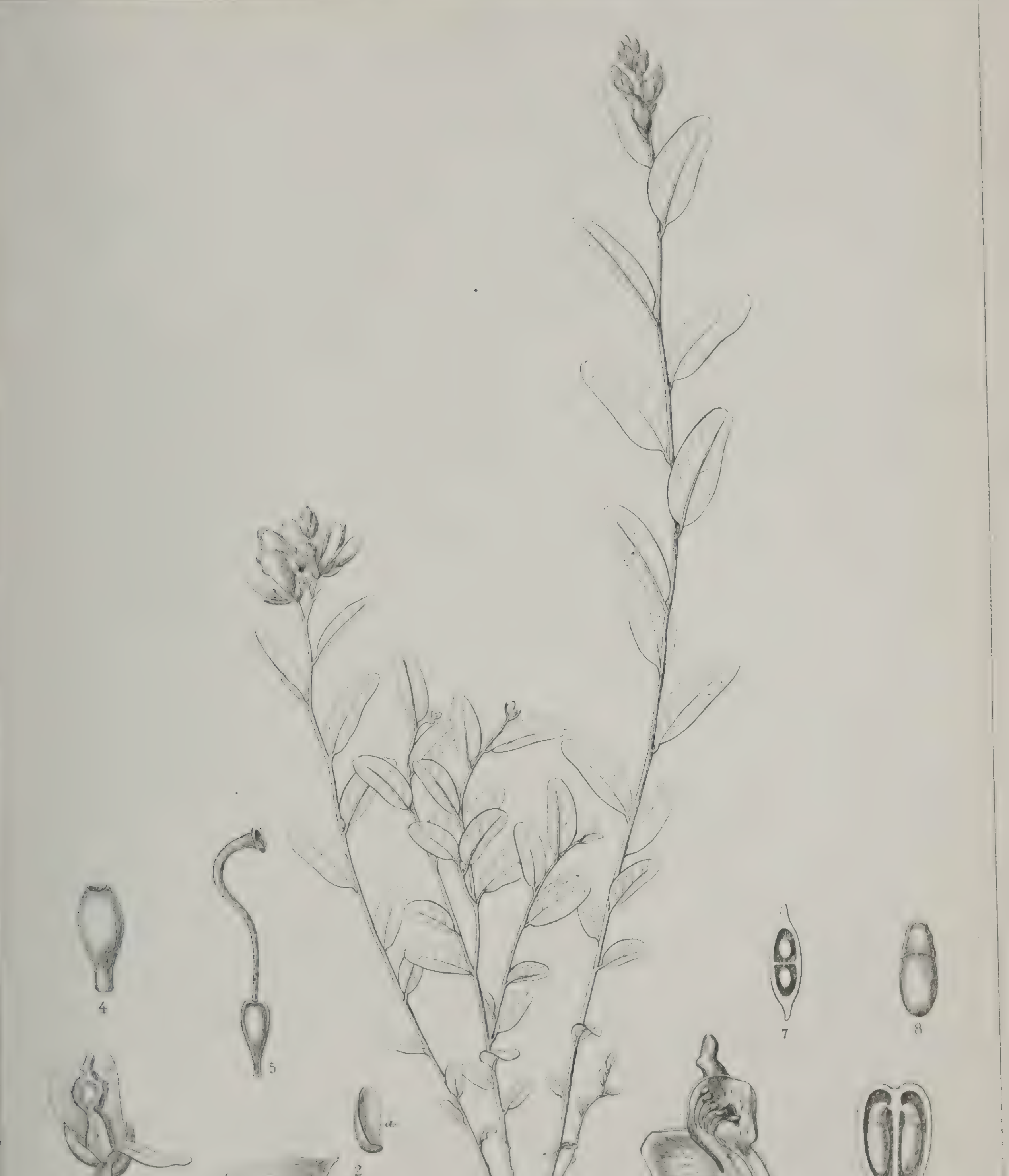
CEANOTHUS RIGIDUS



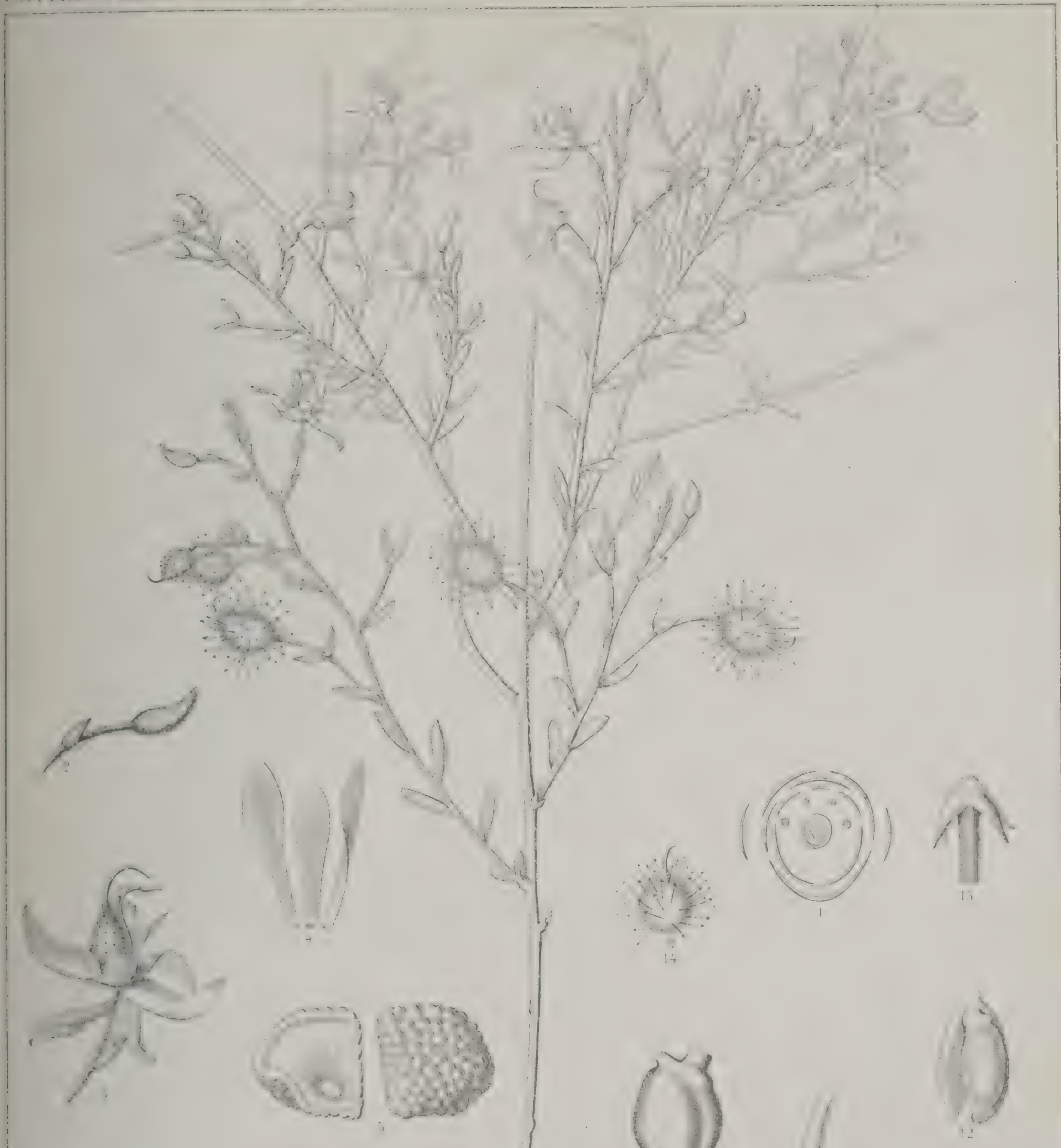
CEANOTHUS DENTATUS



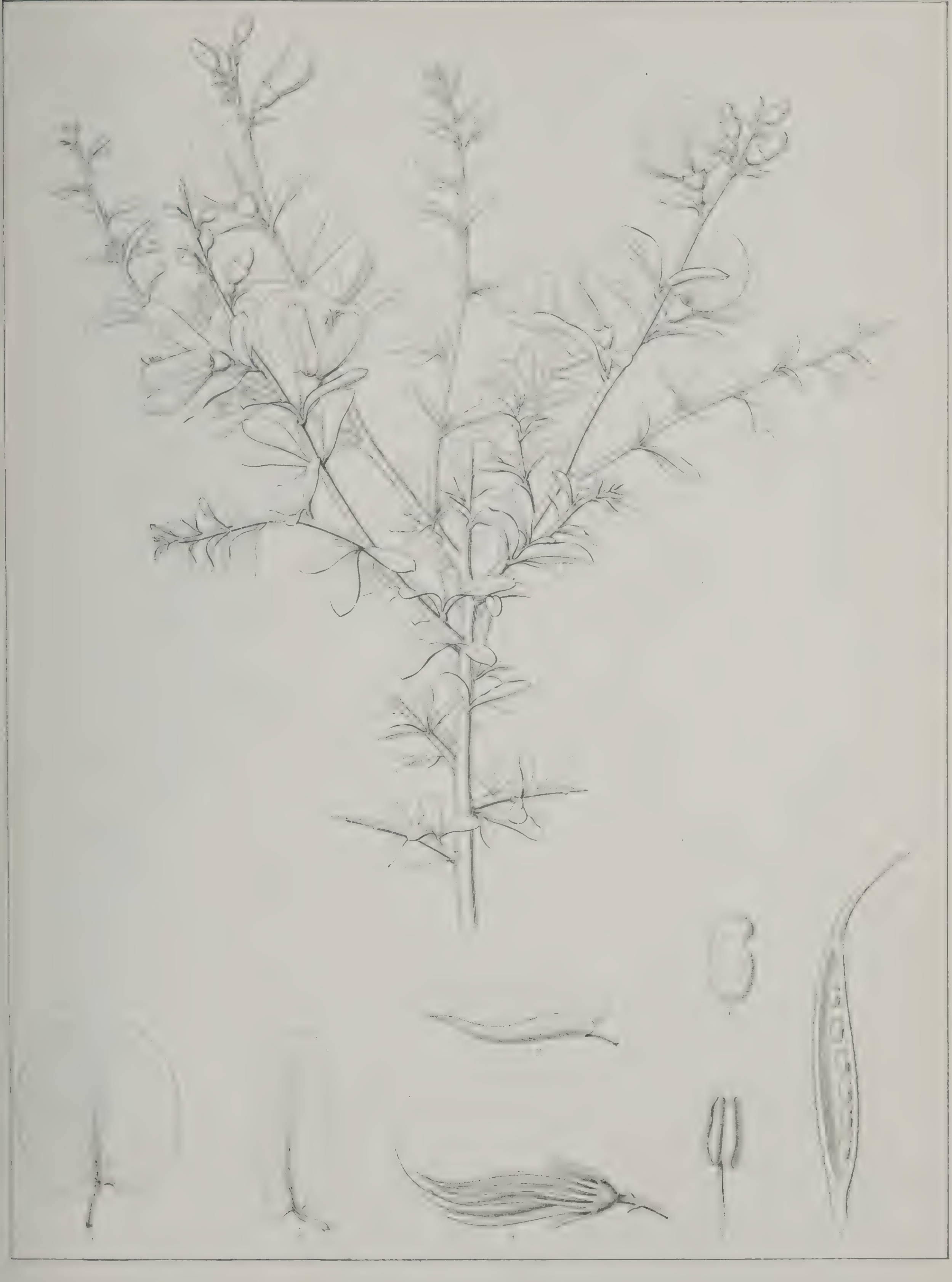
CEANOTHUS CRASSIFOLIUS



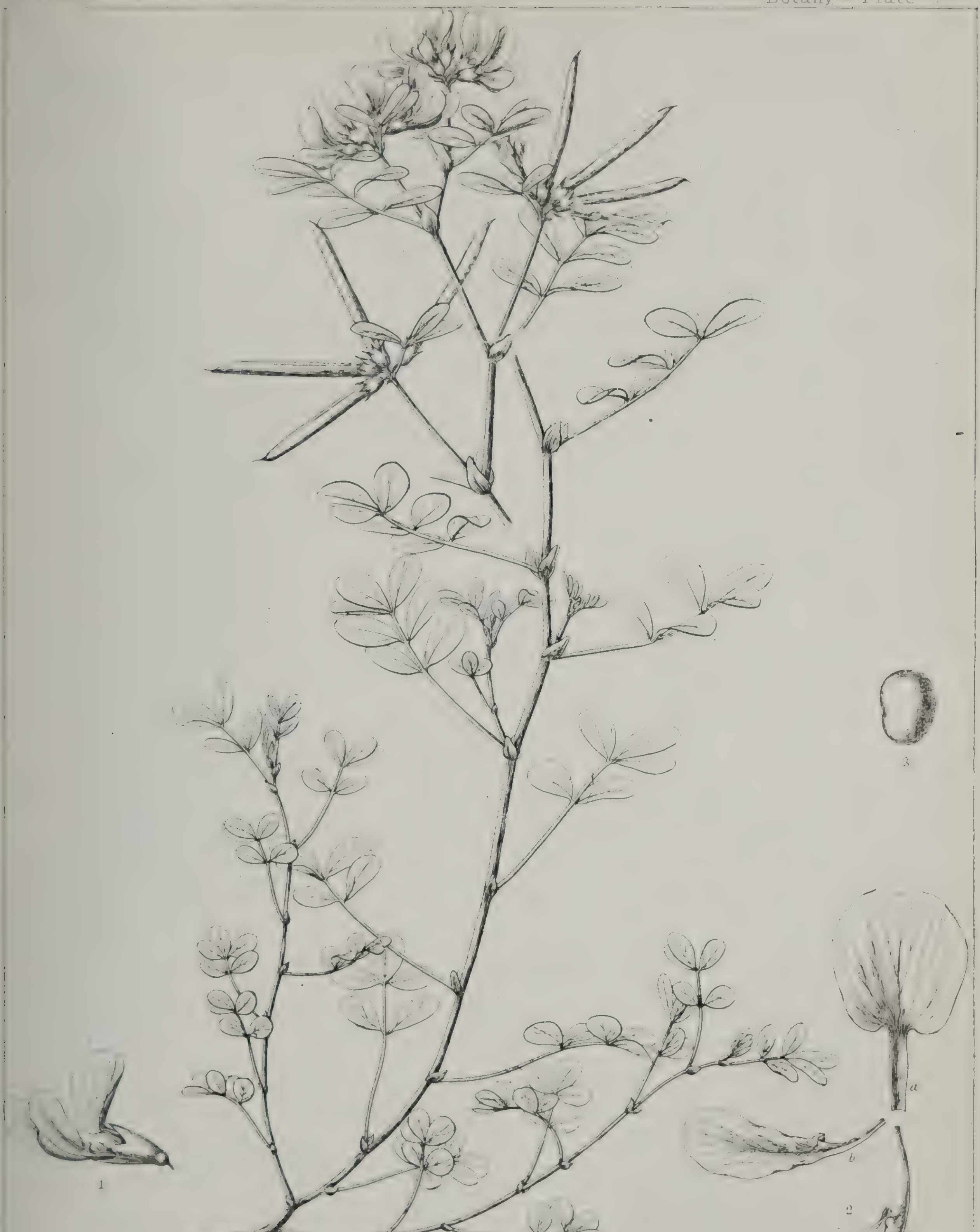
POLYGALA NUTKANA



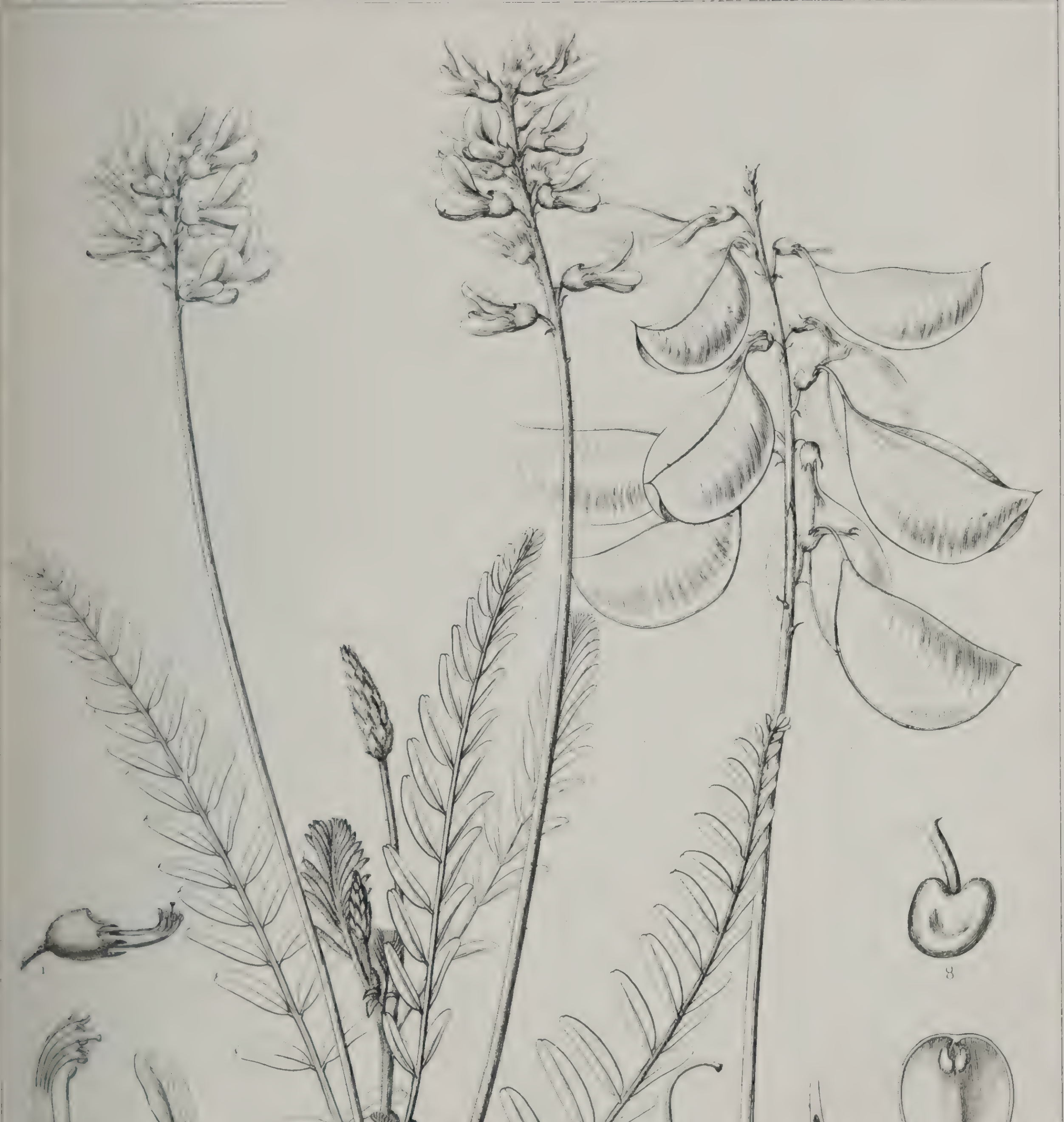
KRAMERIA CANESCENS



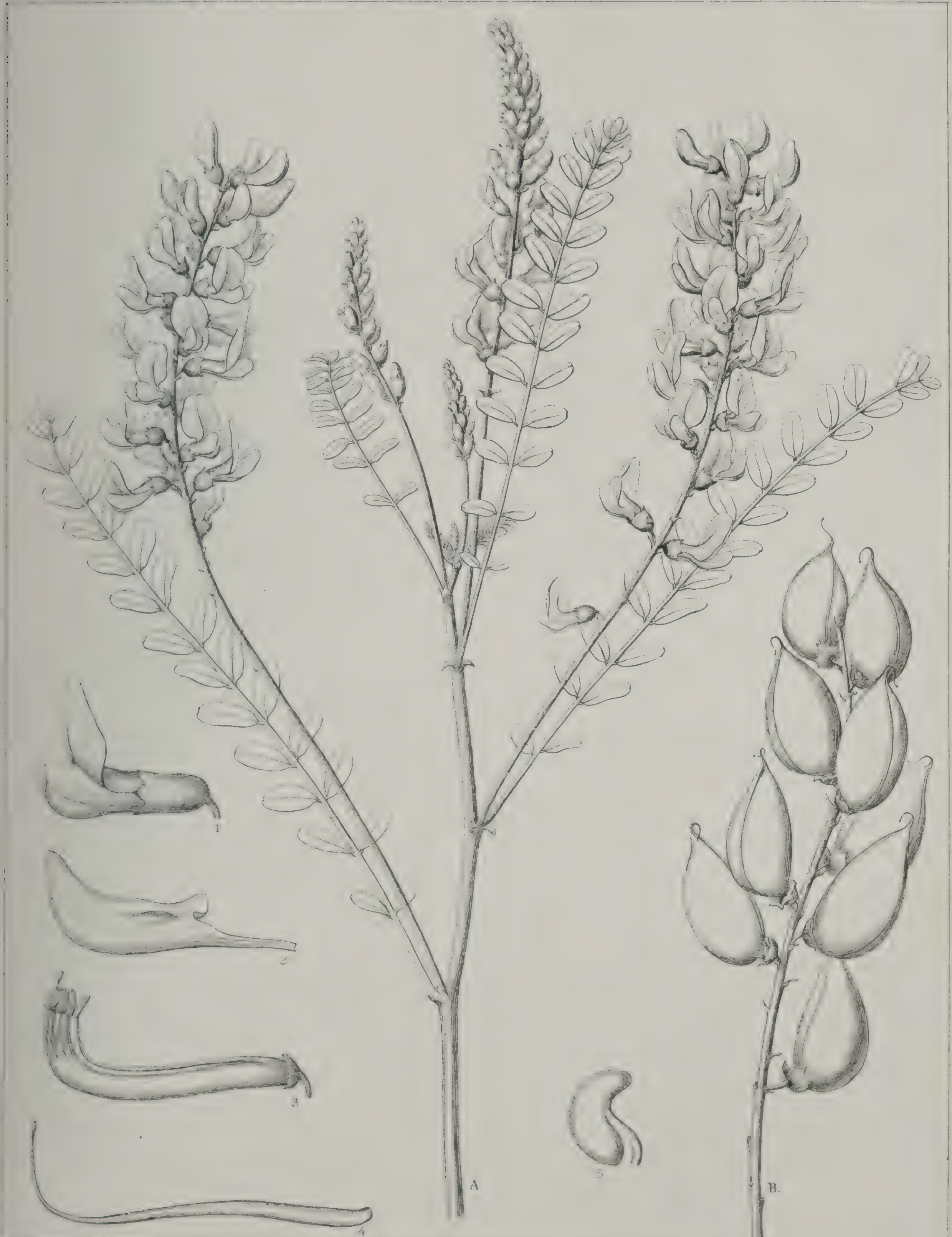
PICKERINGIA MONTANA



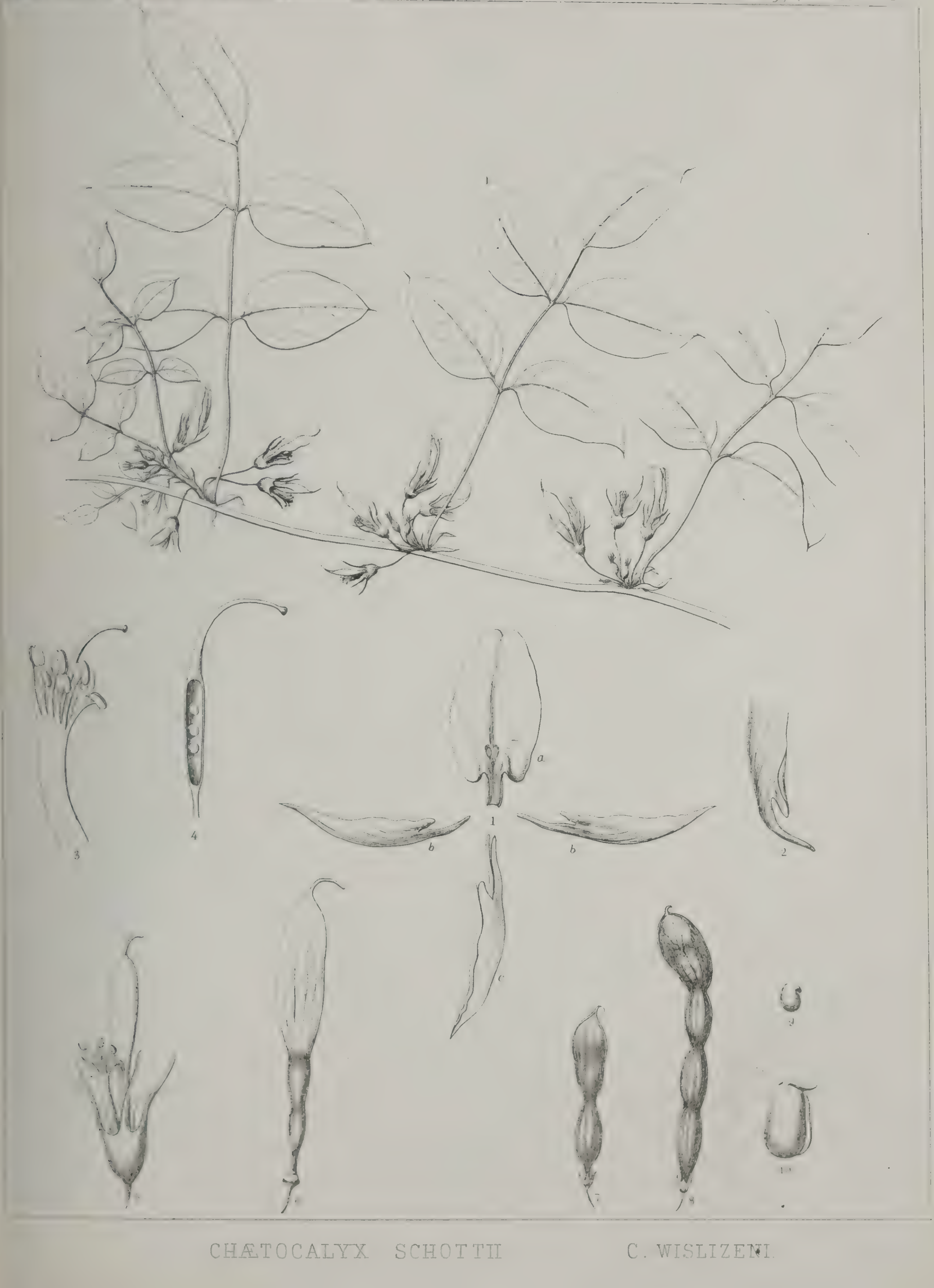
HOSACKIA GRACILIS



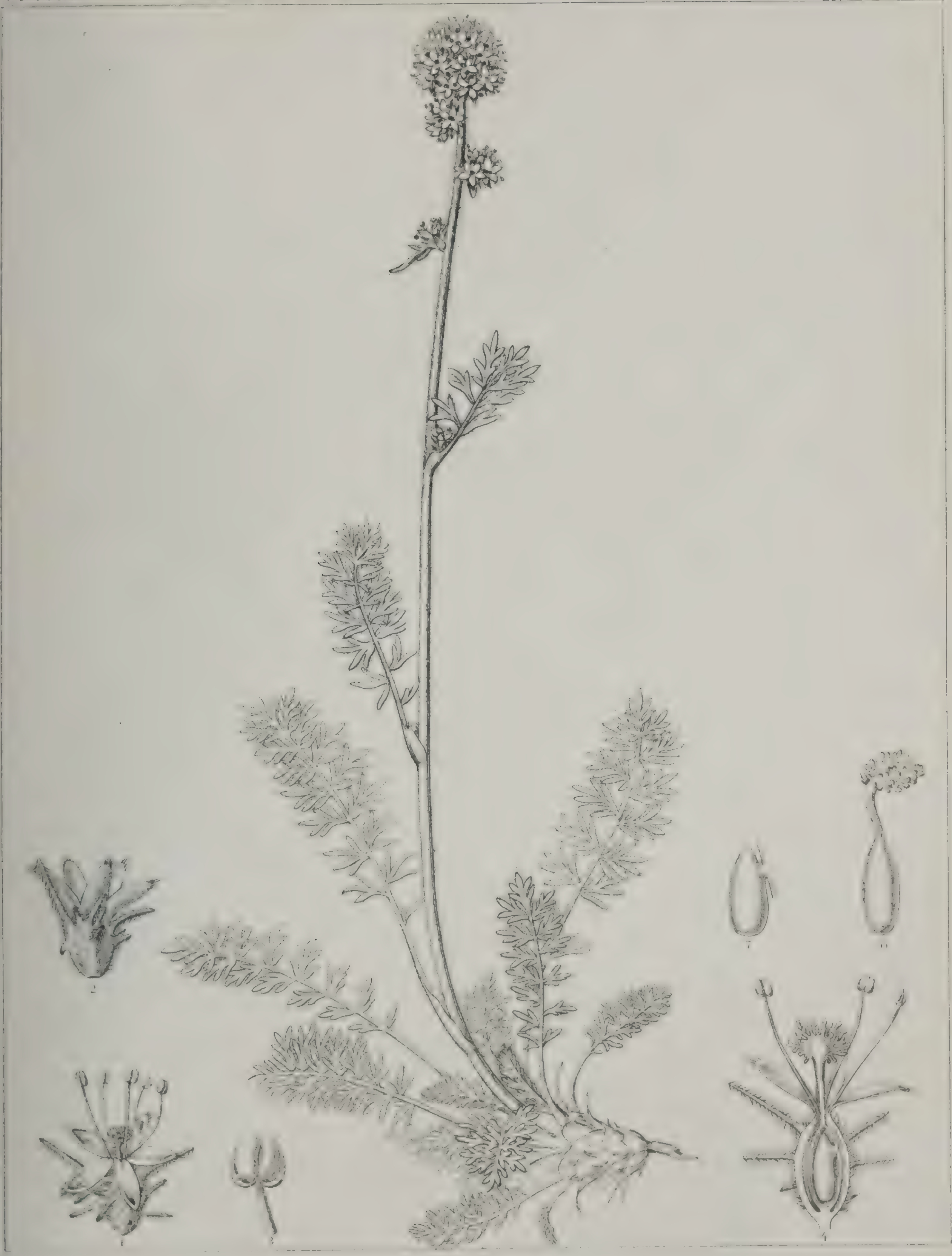
ASTRAGALUS (PHACA) LEUCOPSIS



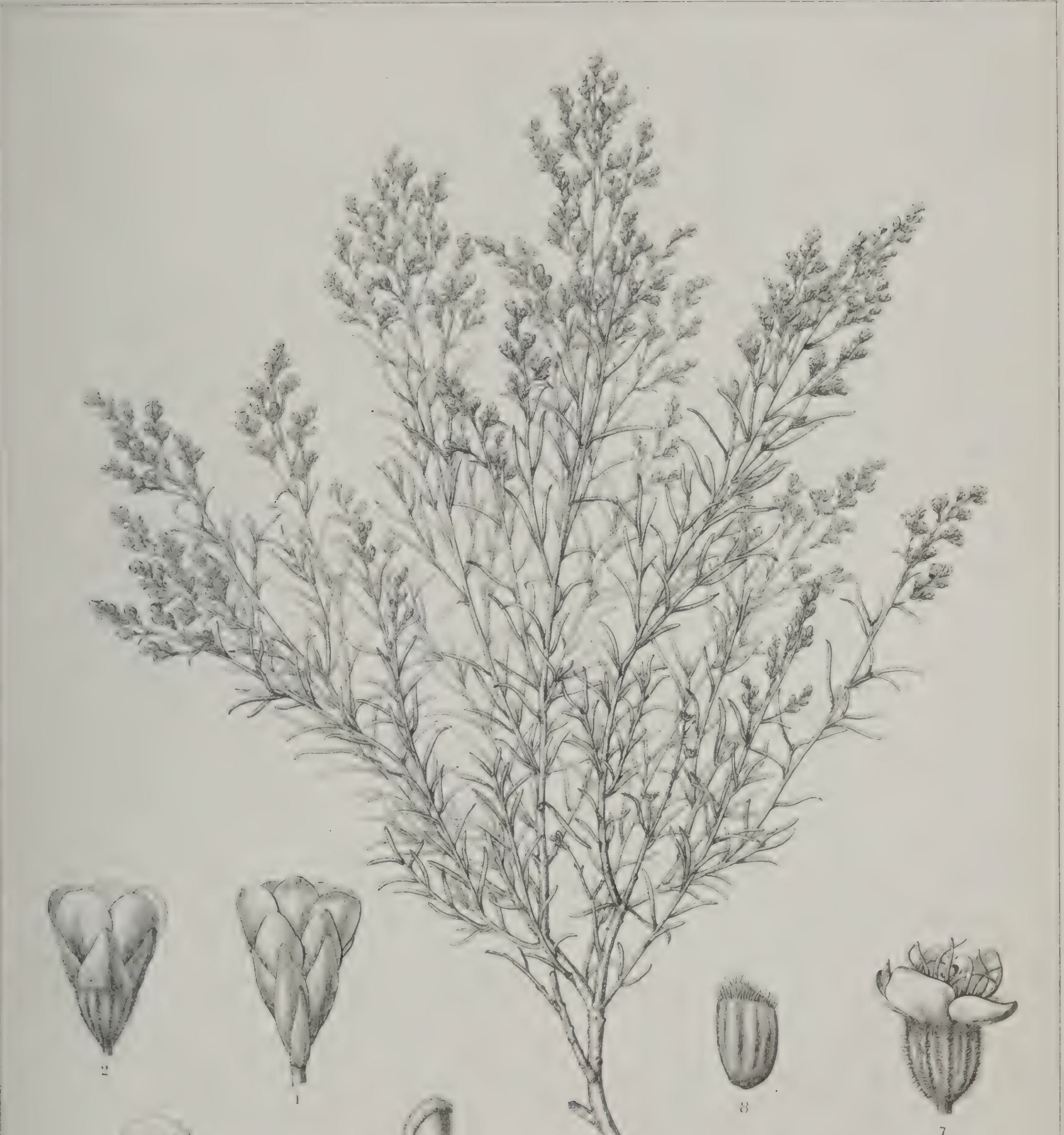
ASTRAGALUS CROTALARIOIDES



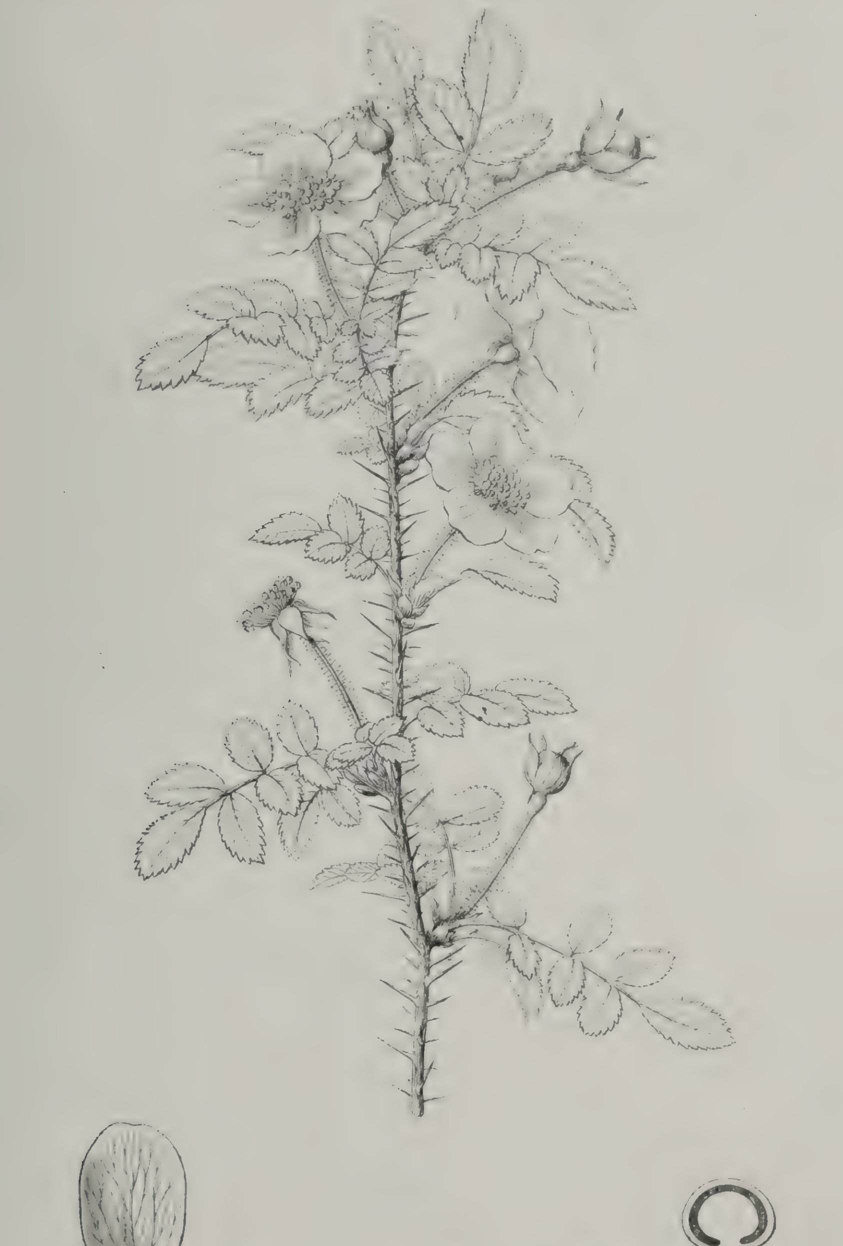
CHÆTOCALYX SCHOTTII   C. WISLIZENI.



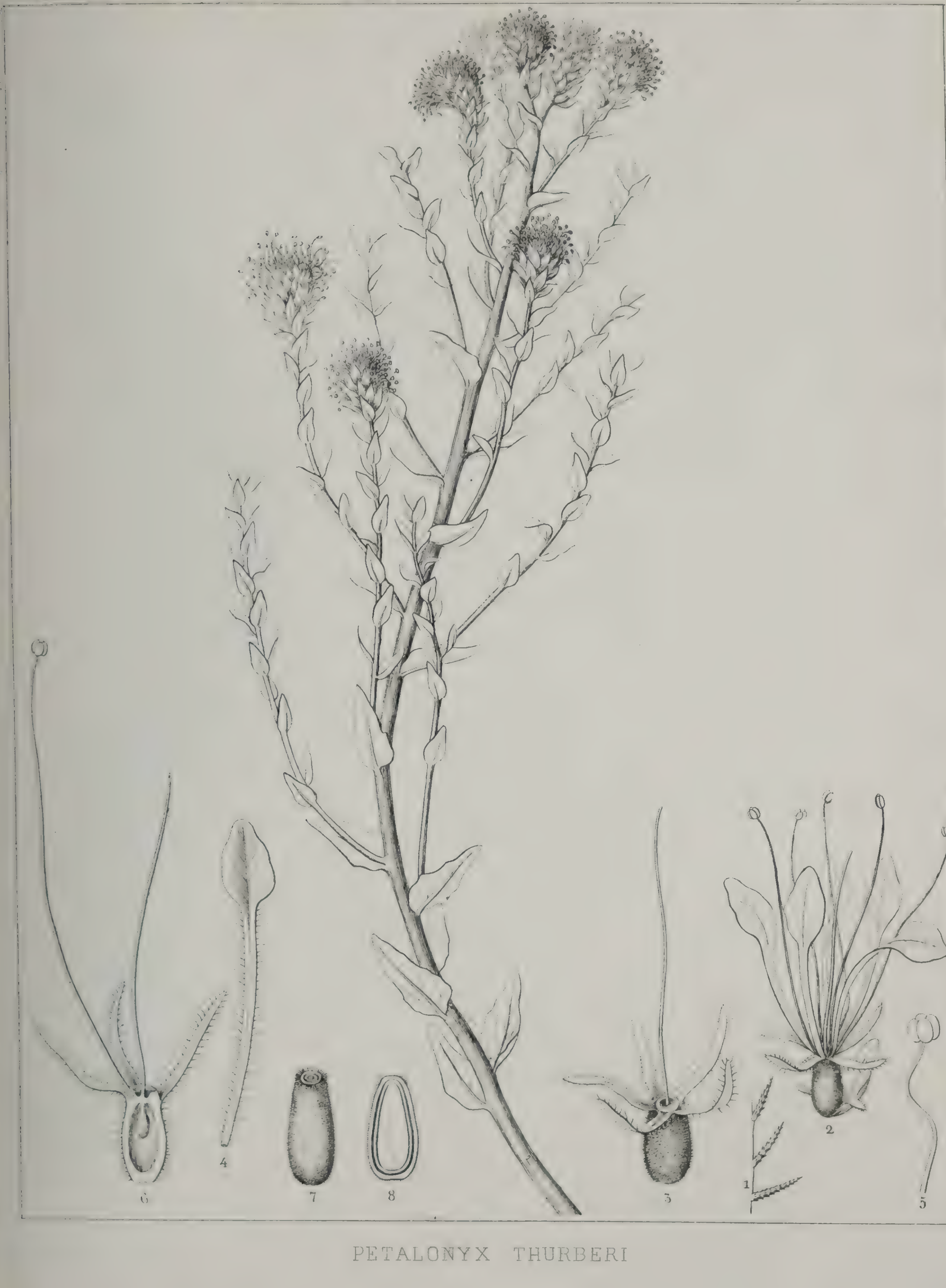
ACÆNA PINNATIFIDA



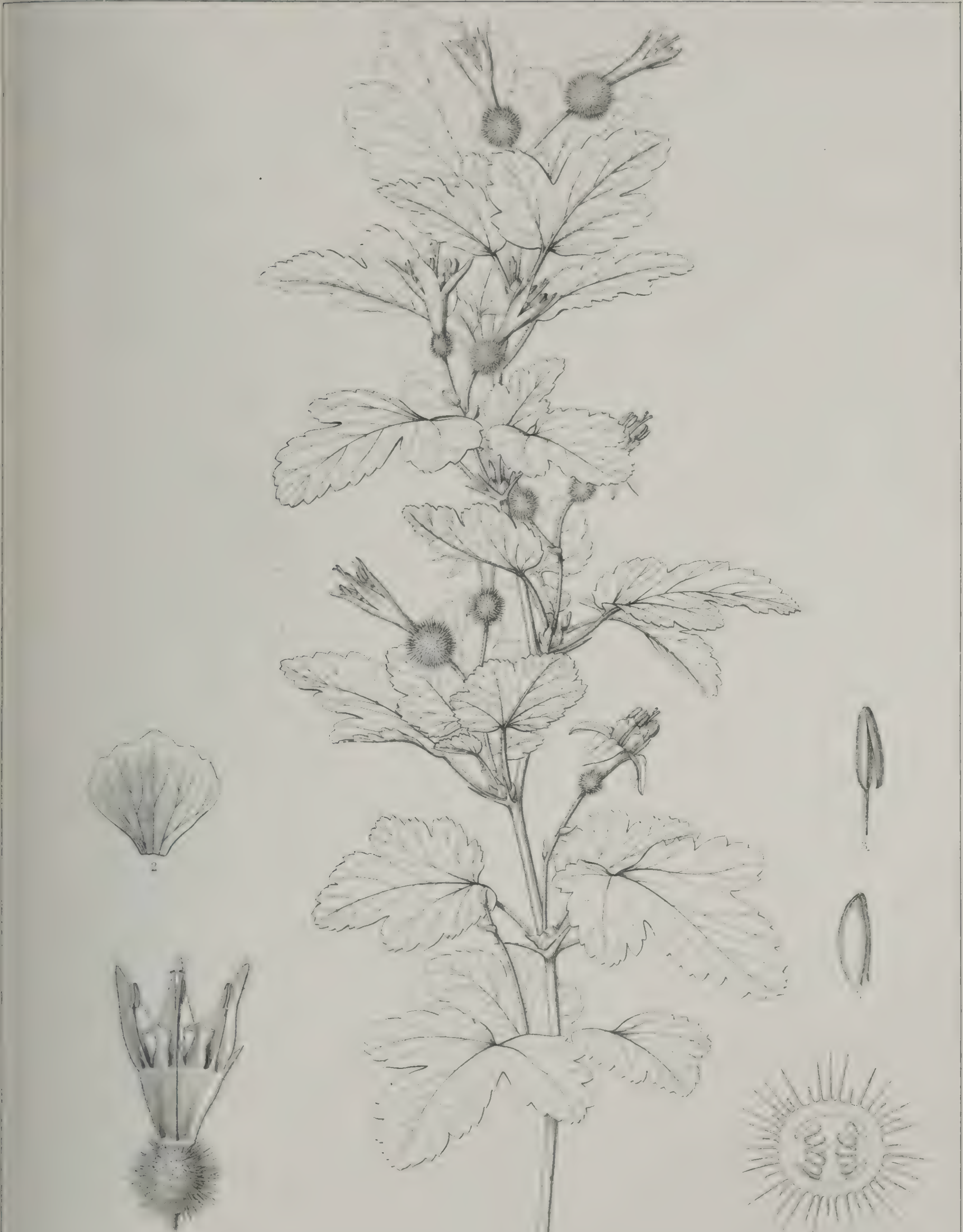
ADENOSTOMA SPARSIFOLIA



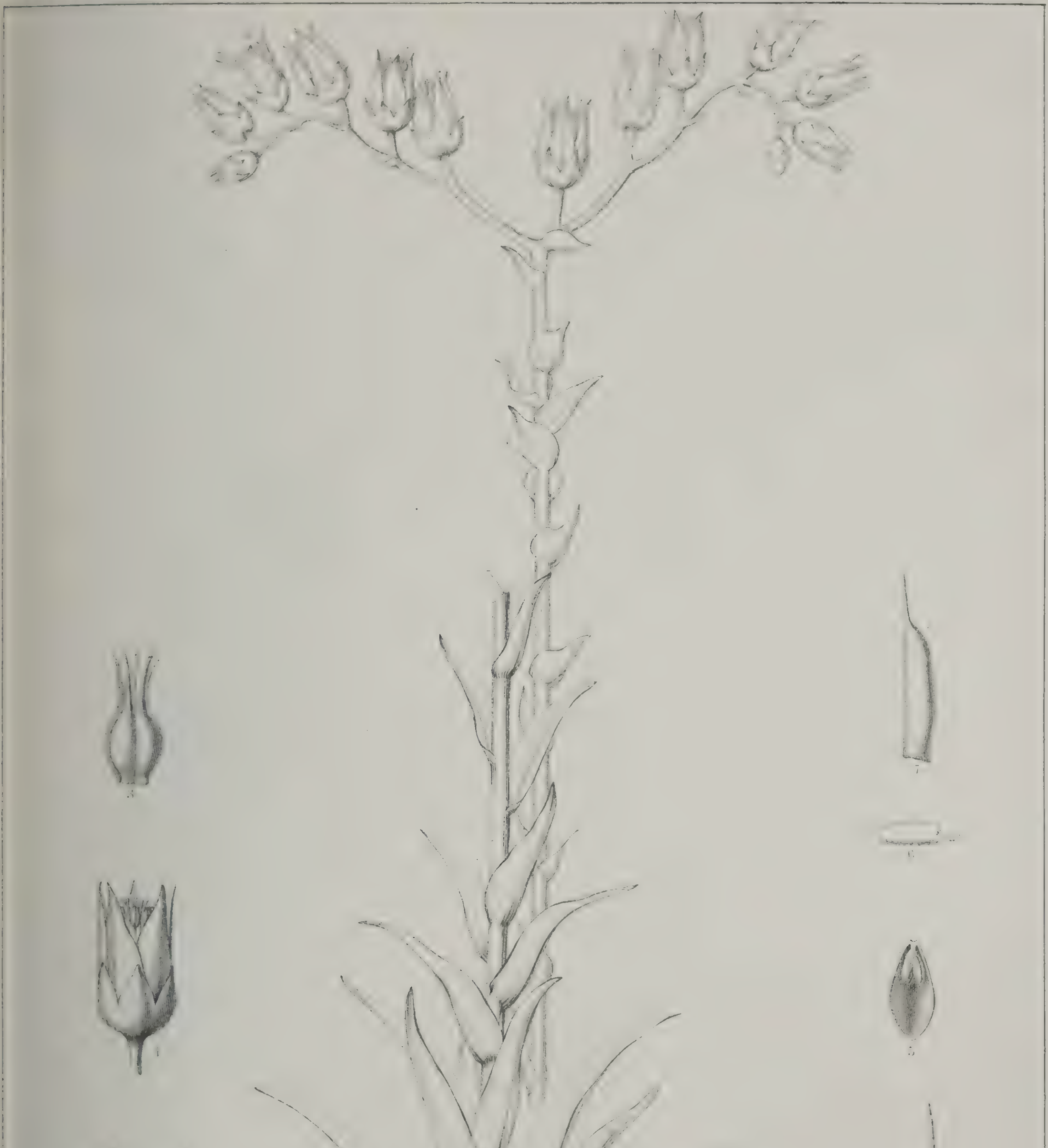
ROSA GYMNOCARPA



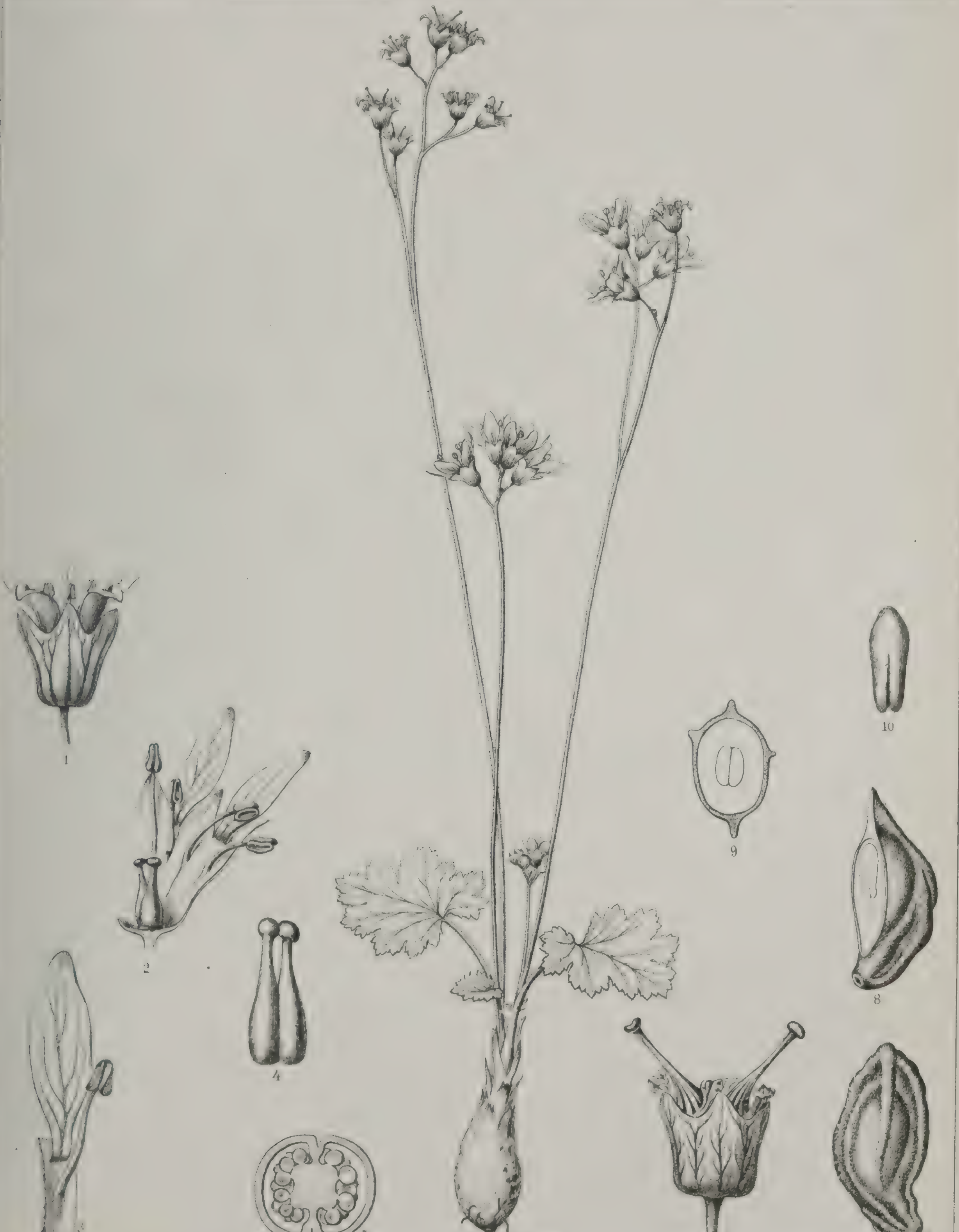
PETALONYX THURBERI



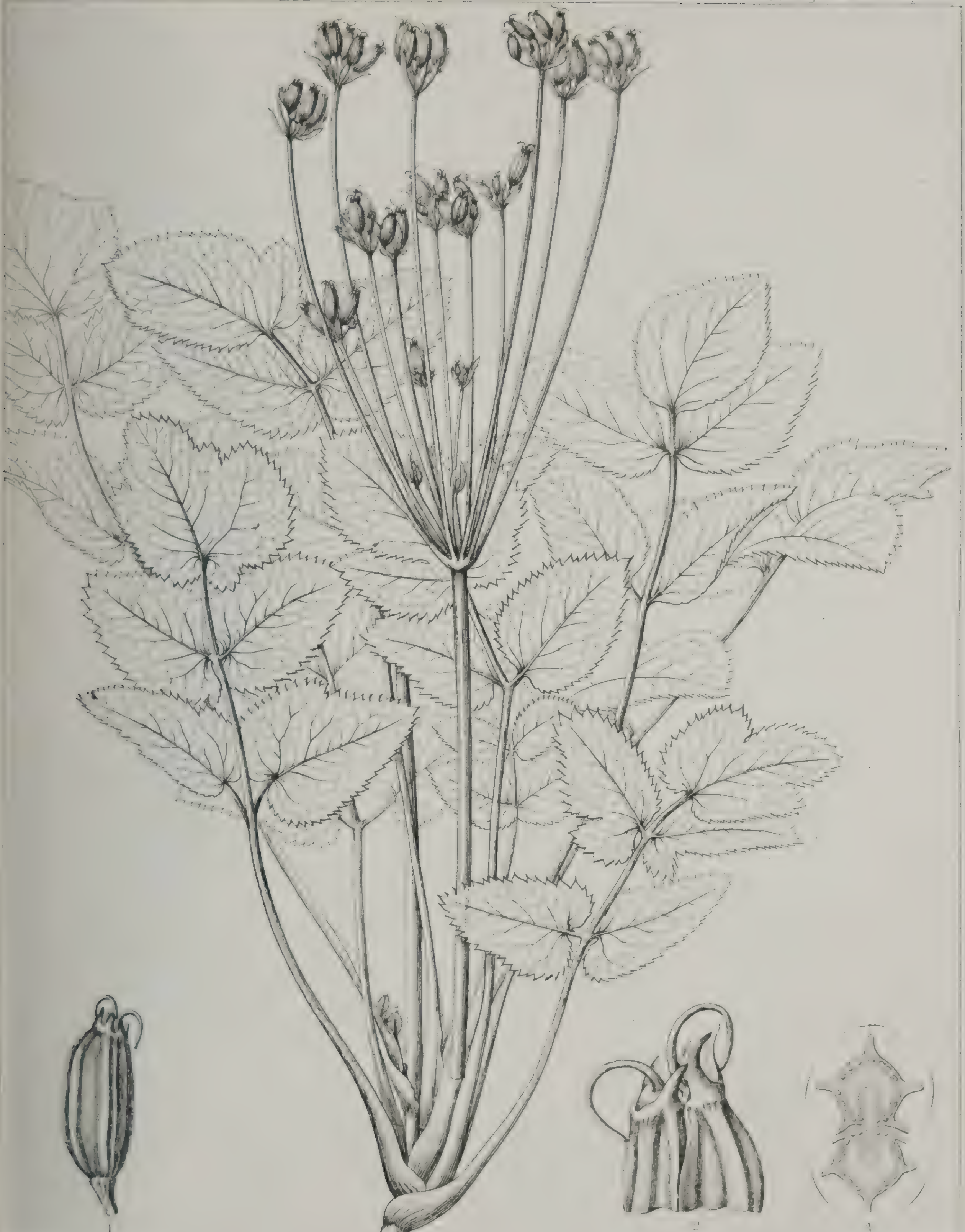
RIBES MENZIESII



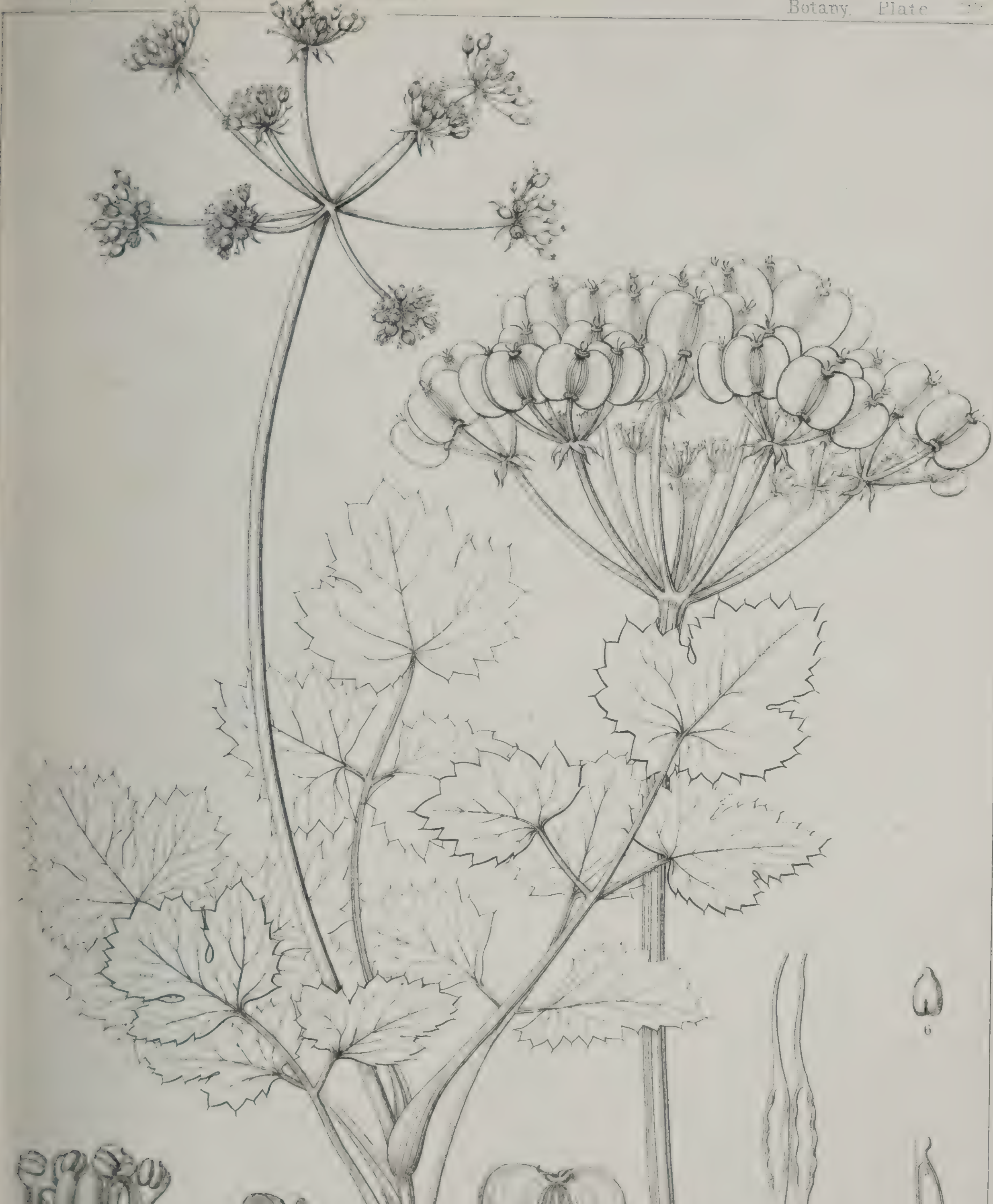
ECHEVERIA LANCEOLATA



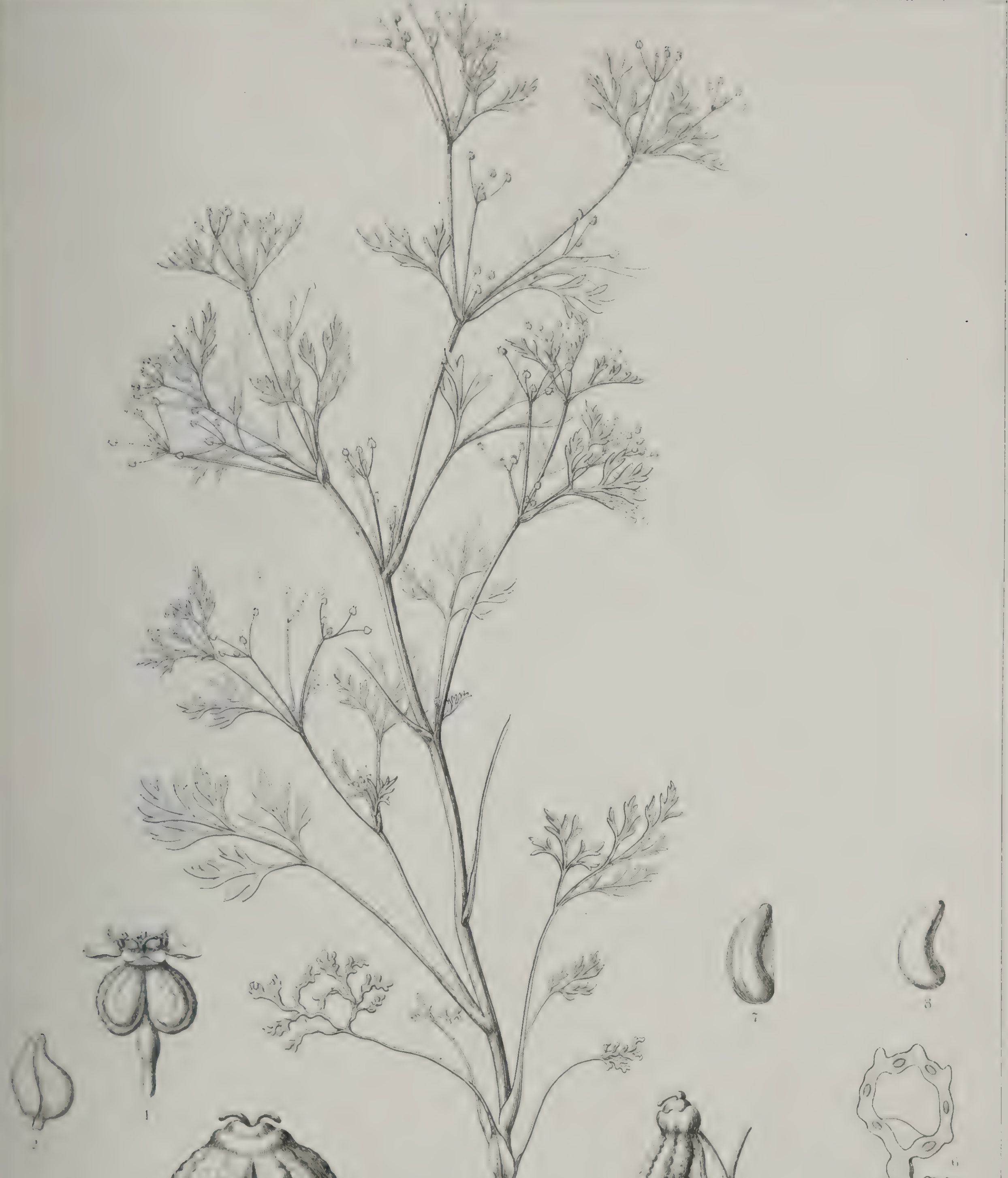
SAXIFRAGA PARRYI



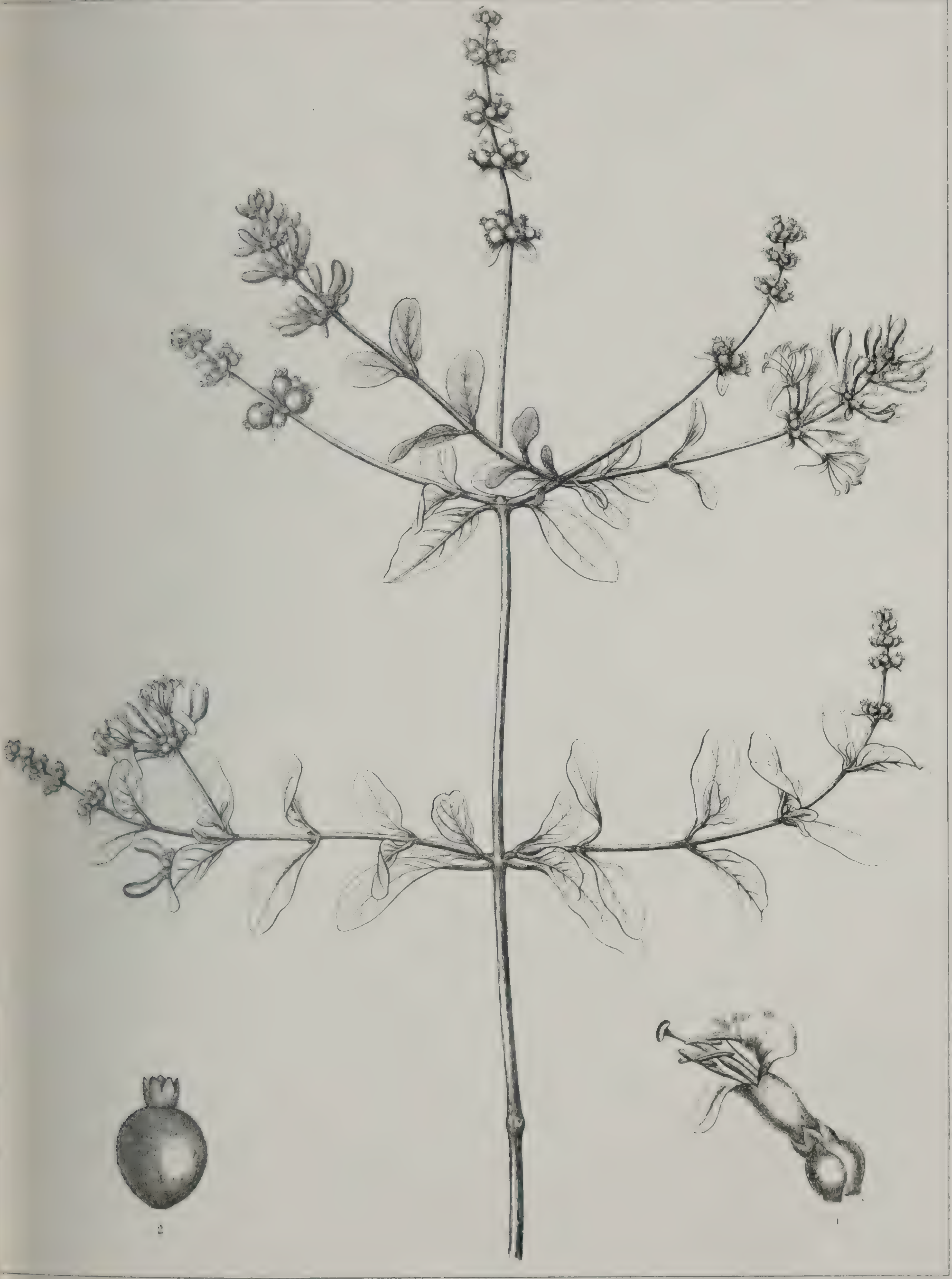
DEWEYA ARGUTA



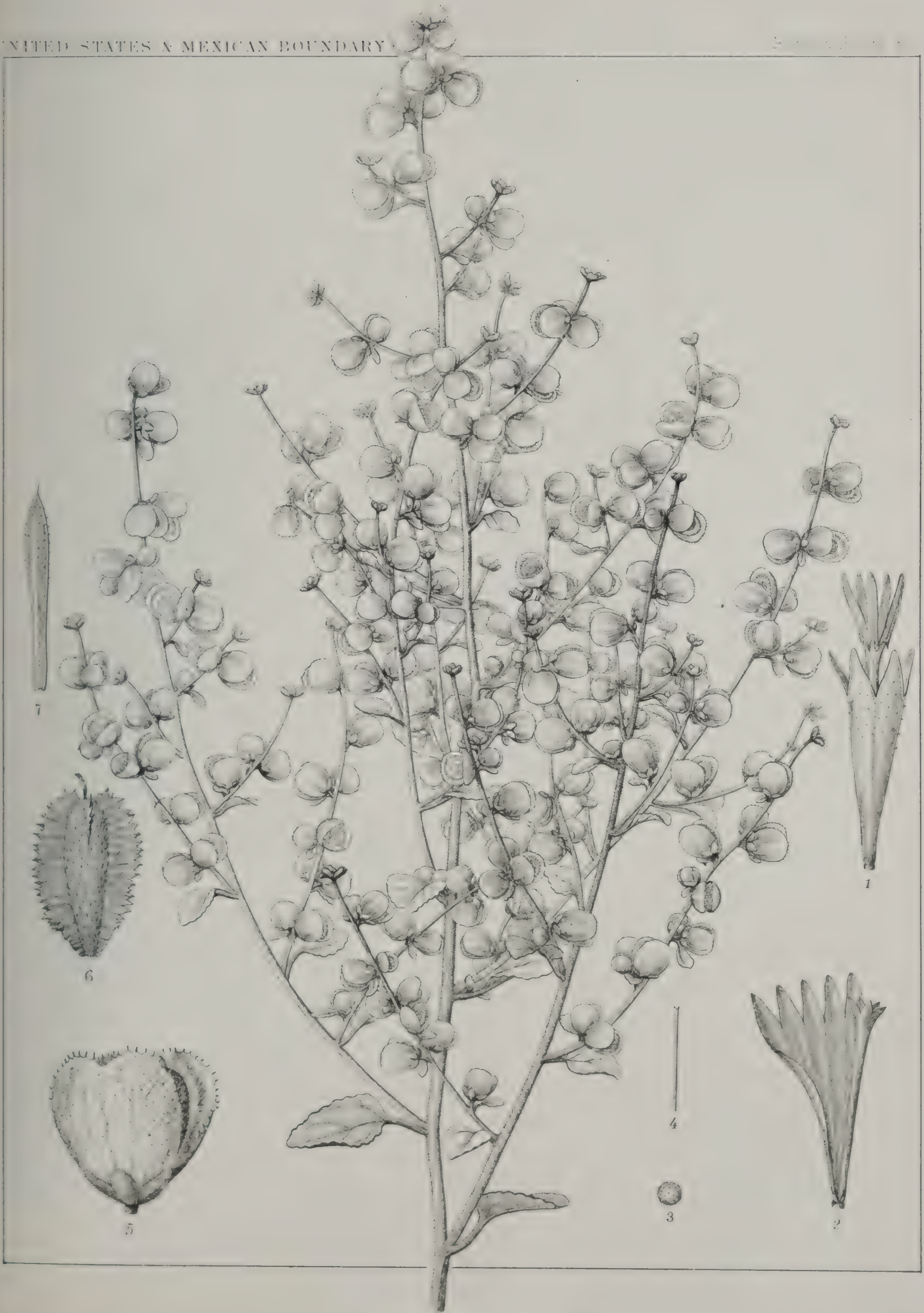
EURYPTERA LUCIDA.



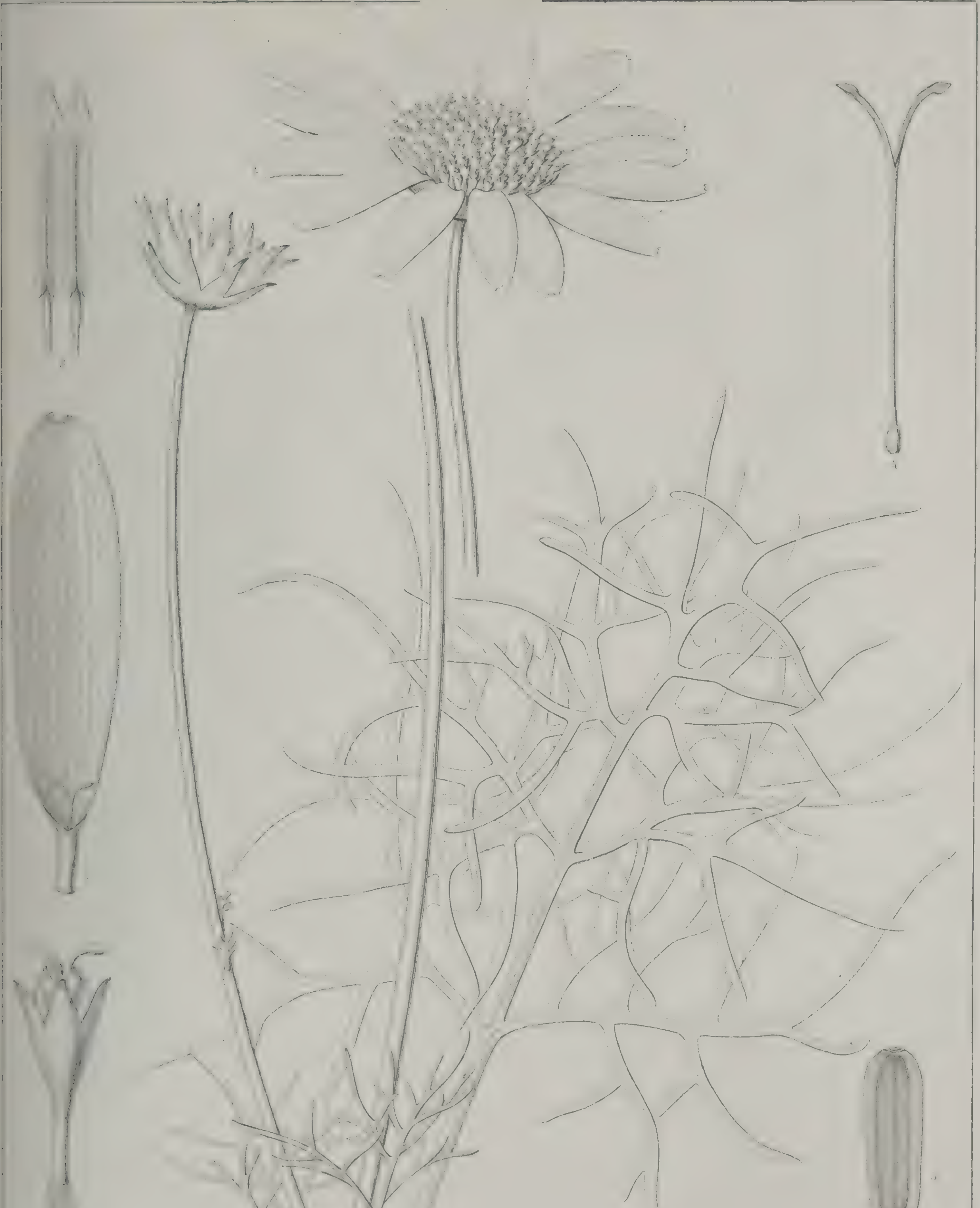
APIASTRUM ANGUSTIFOLIUM



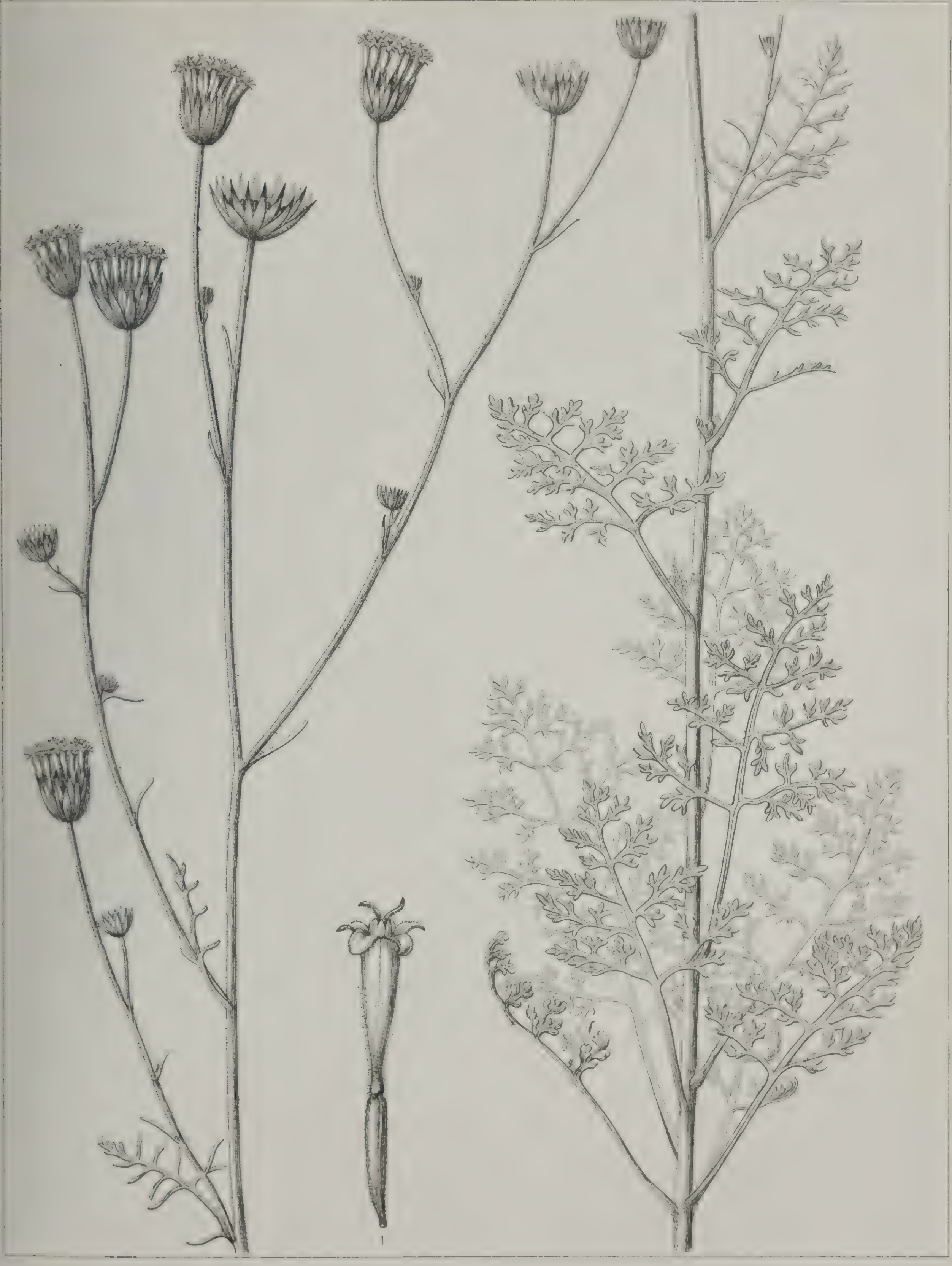
LONICERA SUBSPICATA



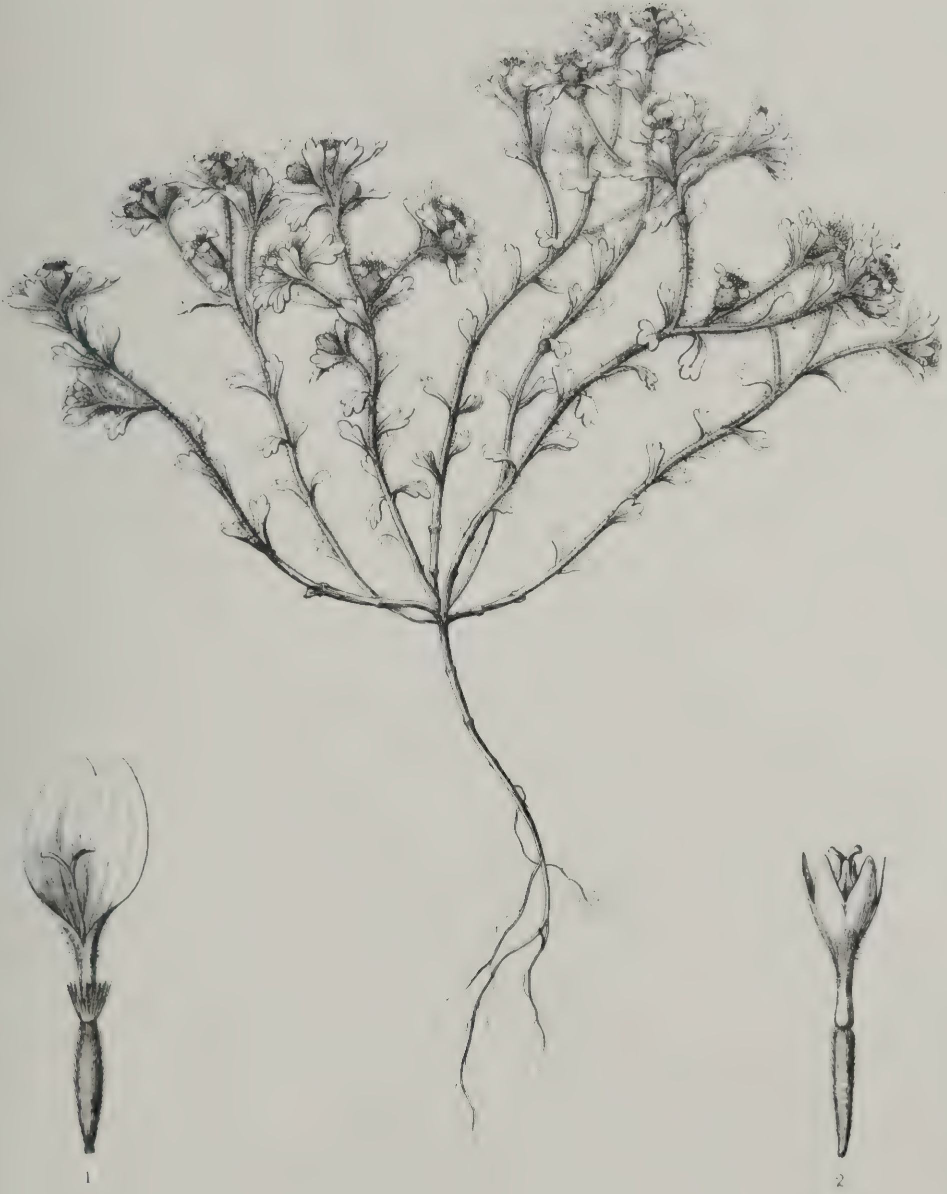
DICORIA CANESCENS



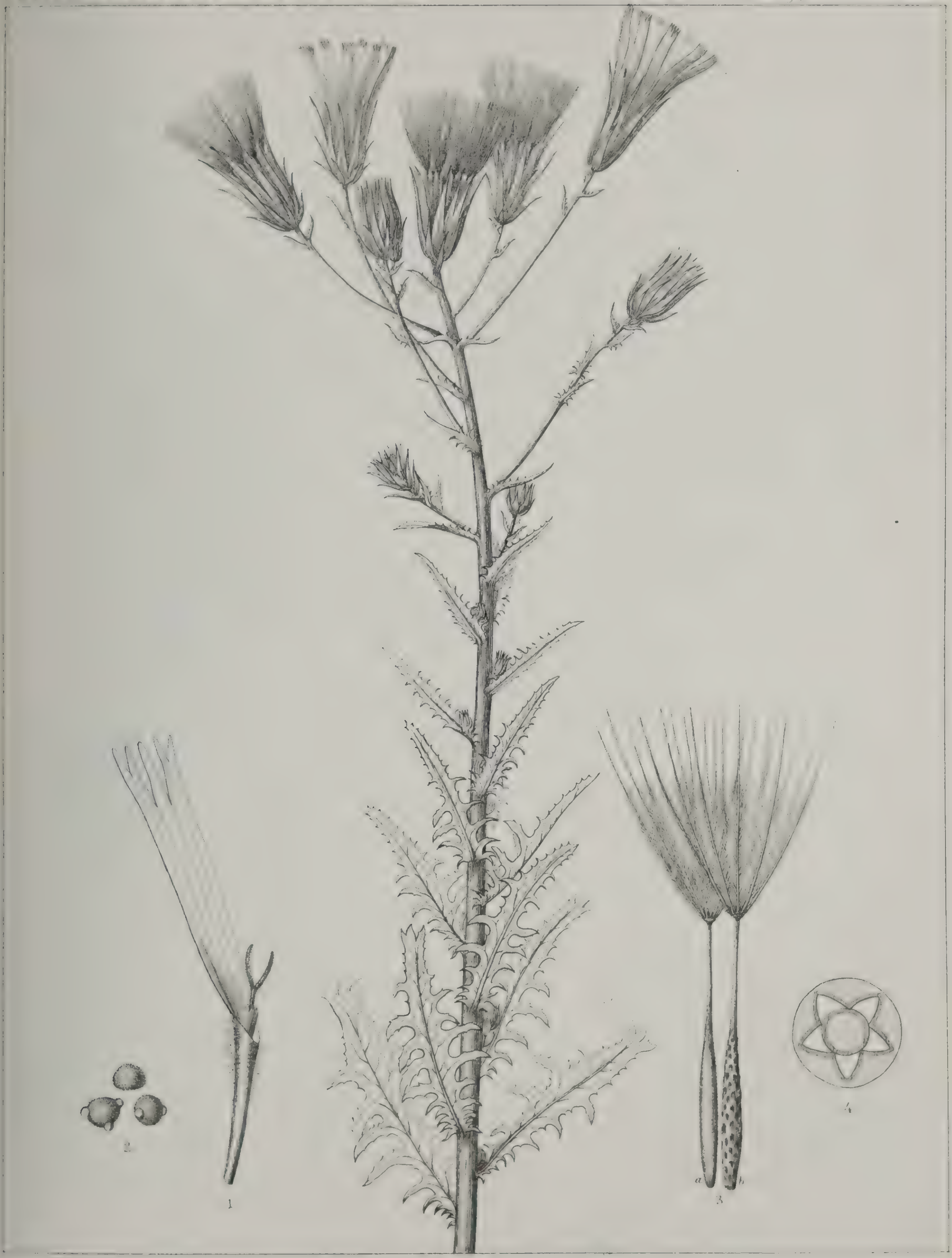
TUCKERMANIA MARITIMA



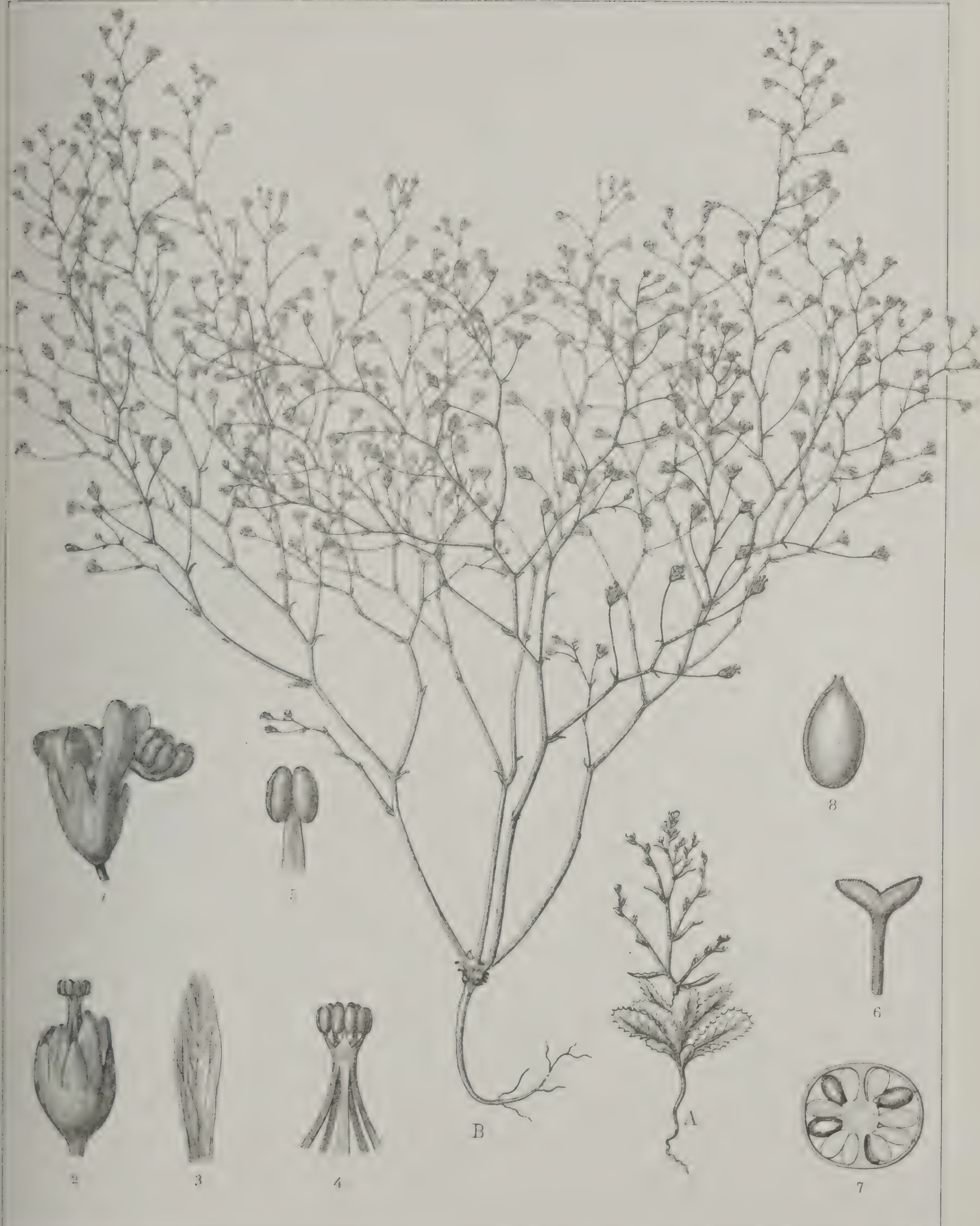
ACARPHÆA ARTEMISIÆFOLIA.



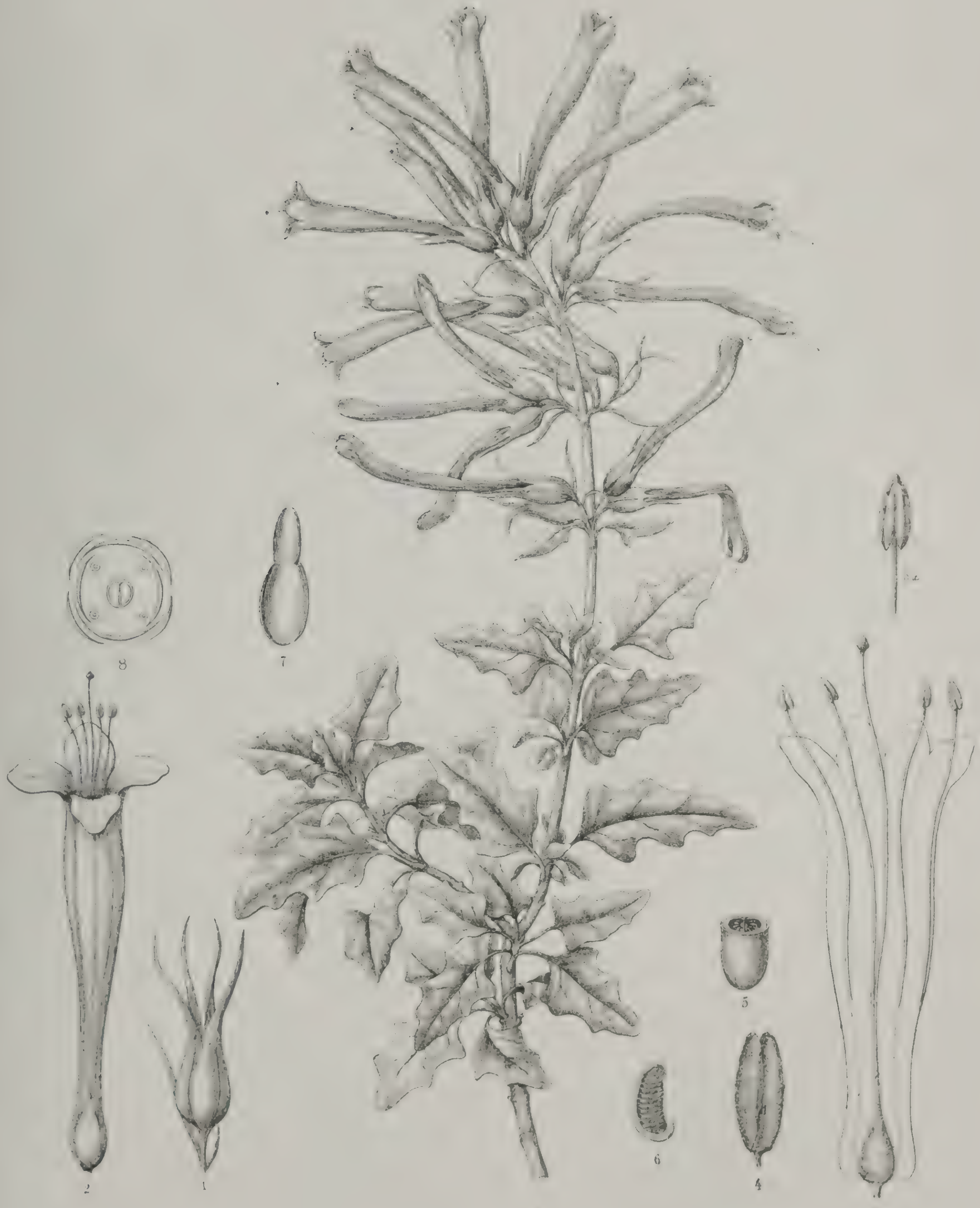
ACTINOLEPIS MULTICAULIS



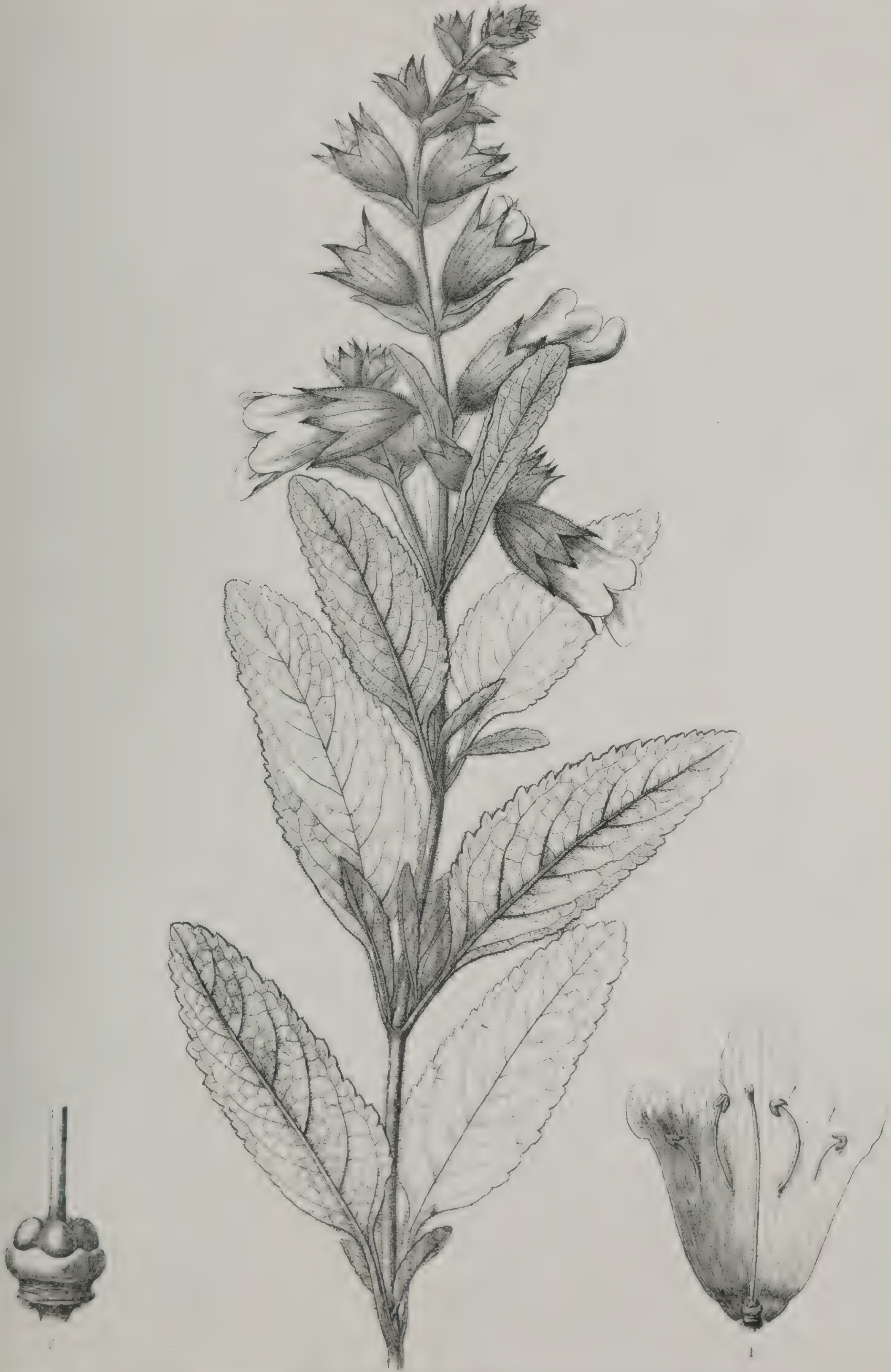
RAFINÉSQUIA CALIFORNICA.



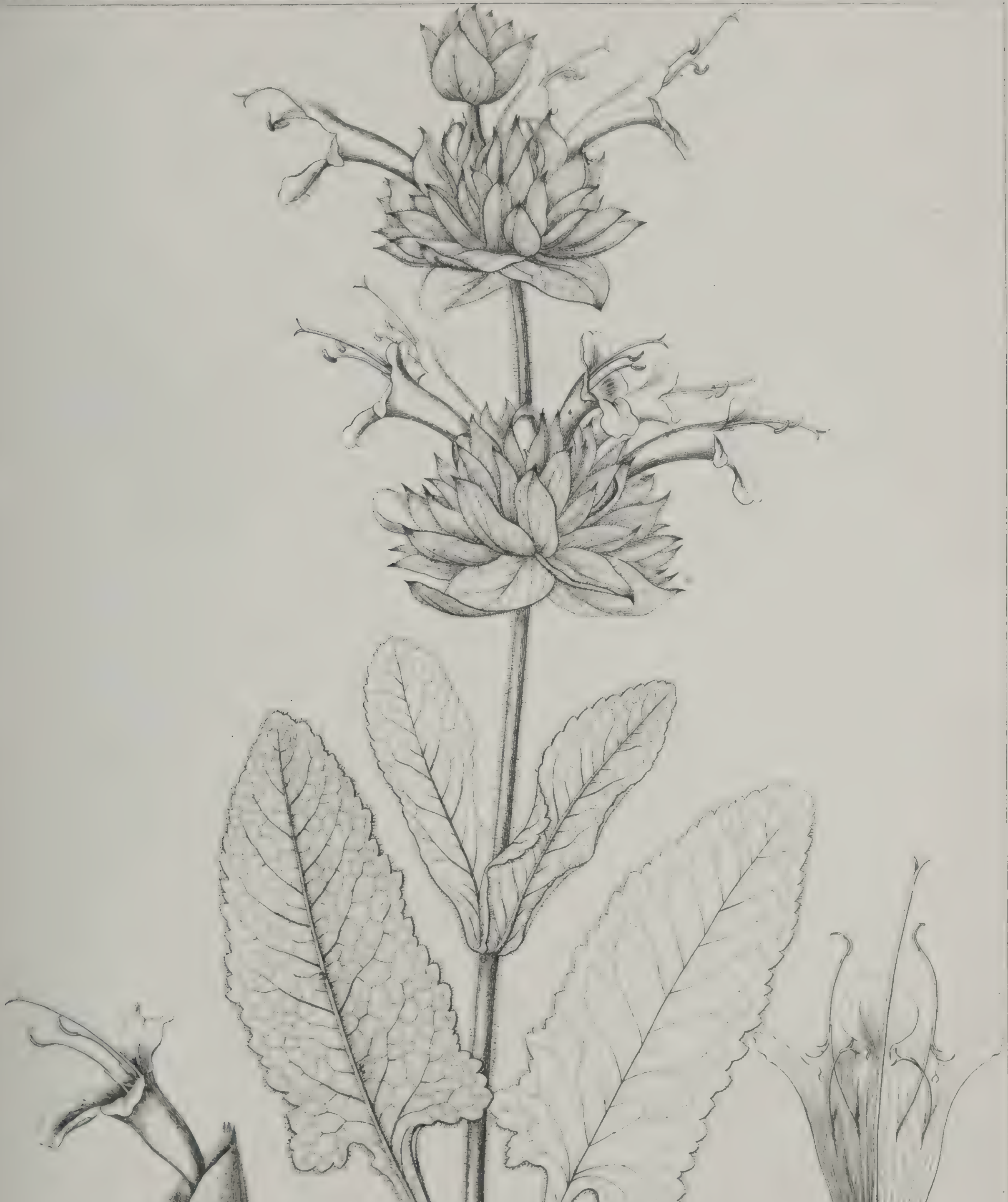
NEMACLADUS RAMOSISSIMUS



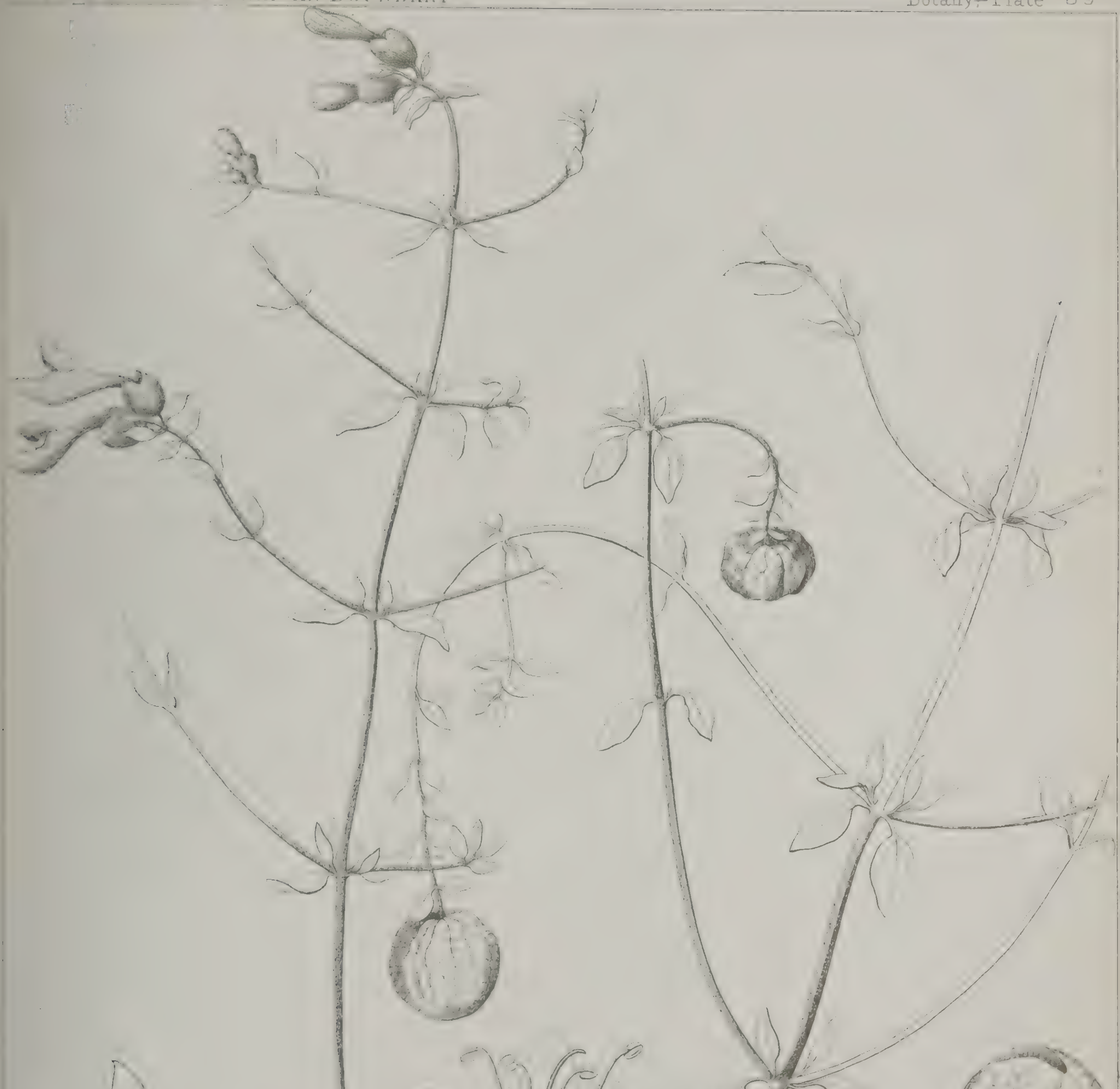
EMORYA SUAVEOLENS



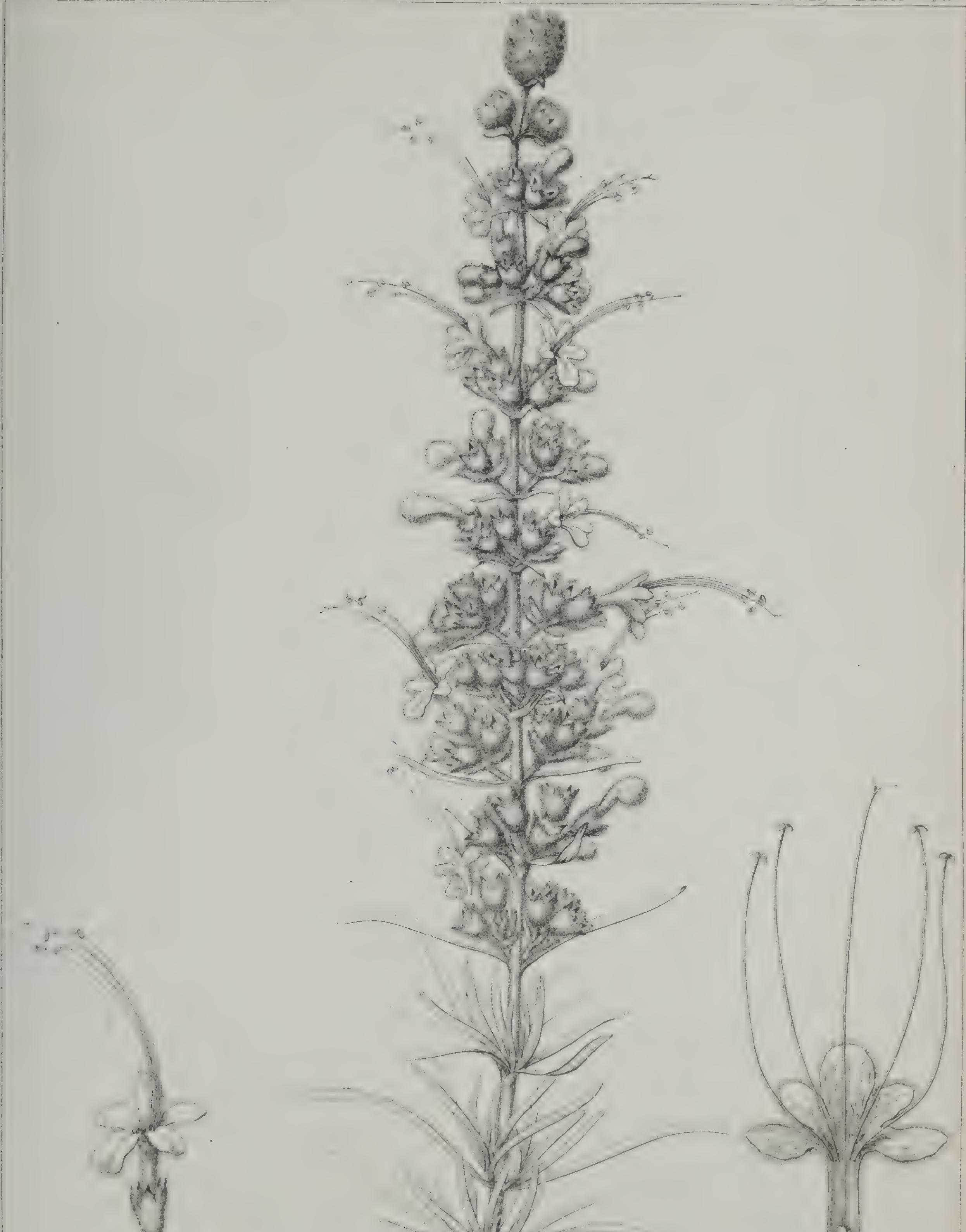
SPHACELE CALYCINA



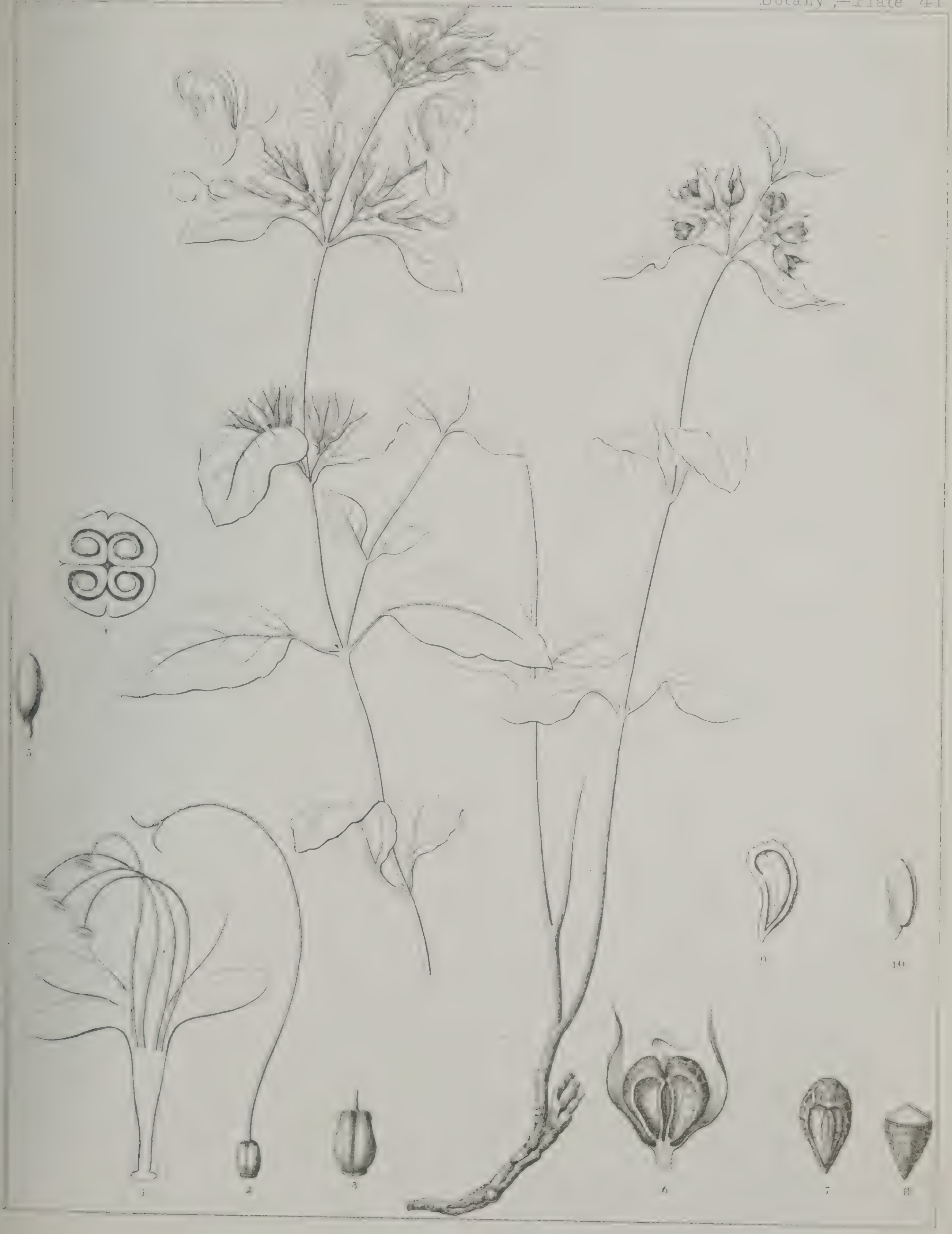
AUDIBERTIA GRANDIFLORA.



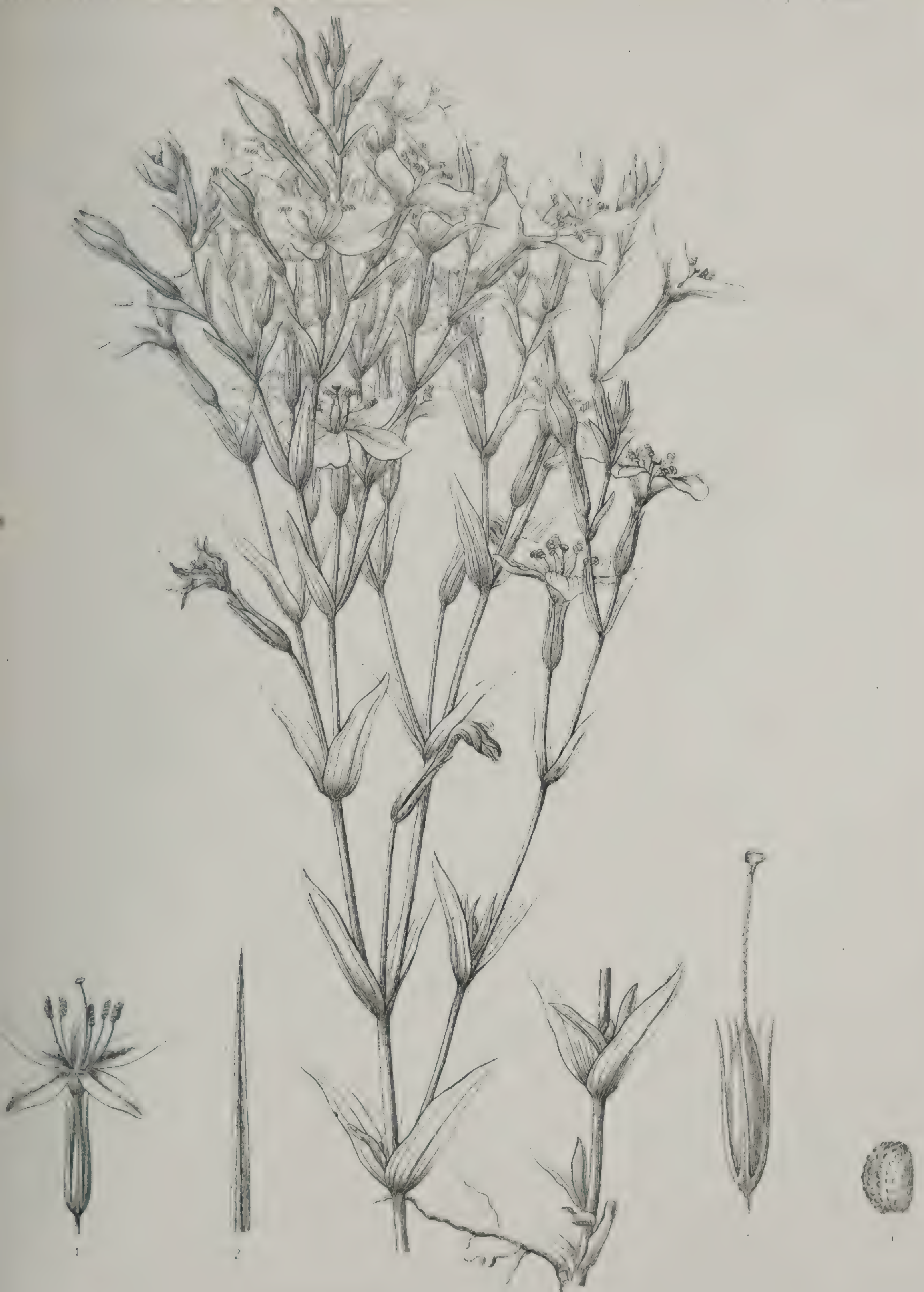
SALIZARIA MEXICANA.



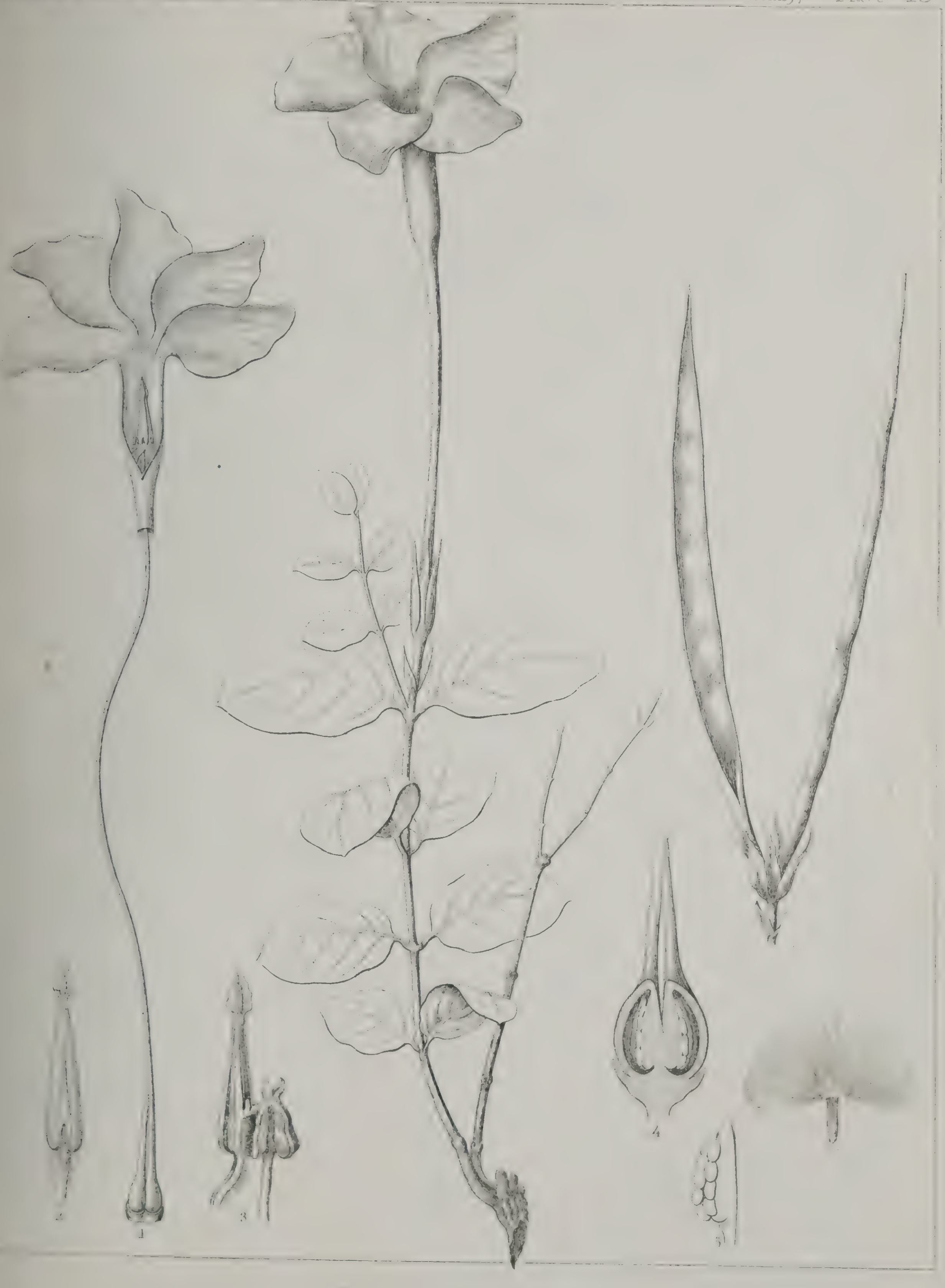
TRICHOSTEMA LANATUM



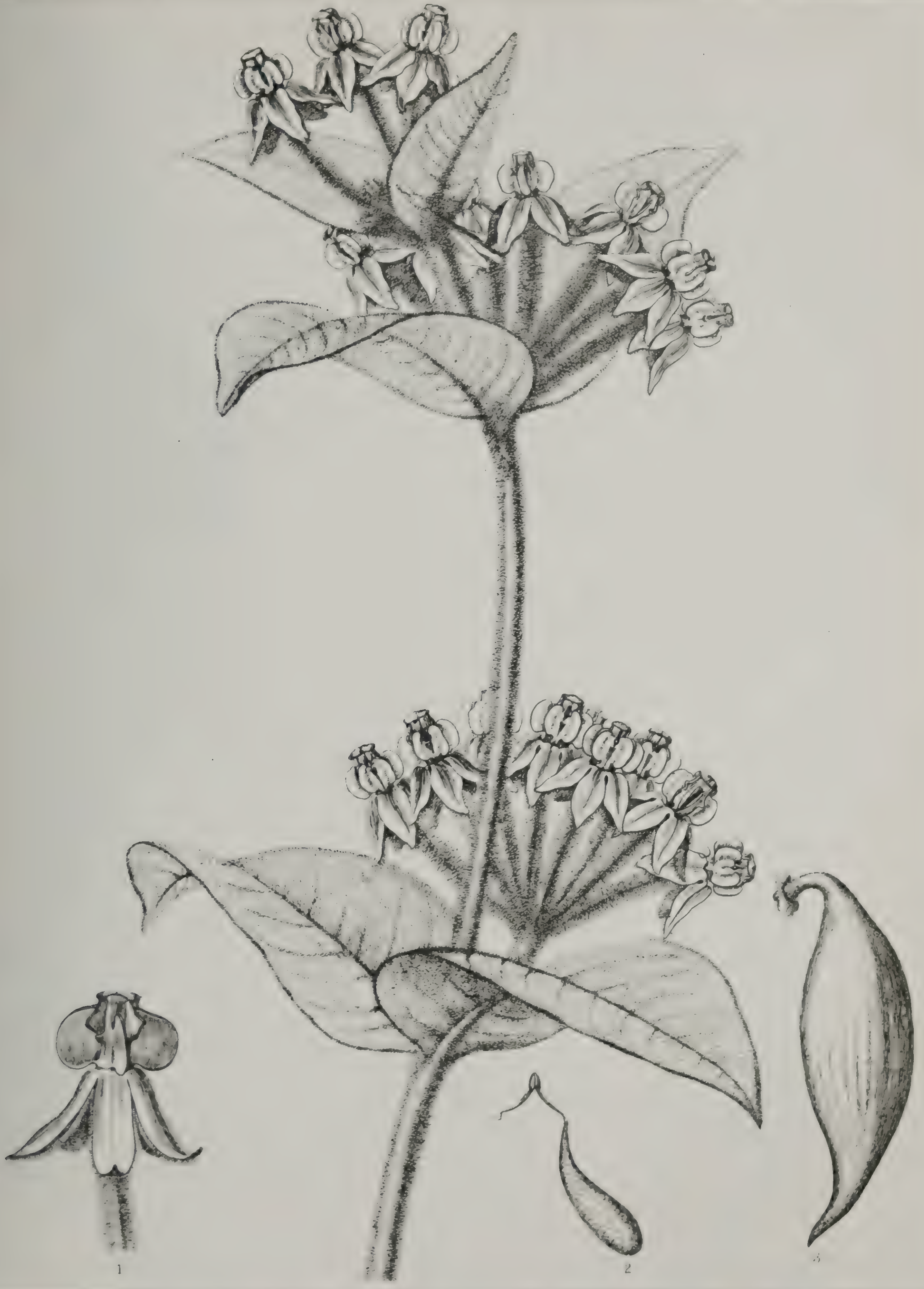
TETRACLEA COULTERI



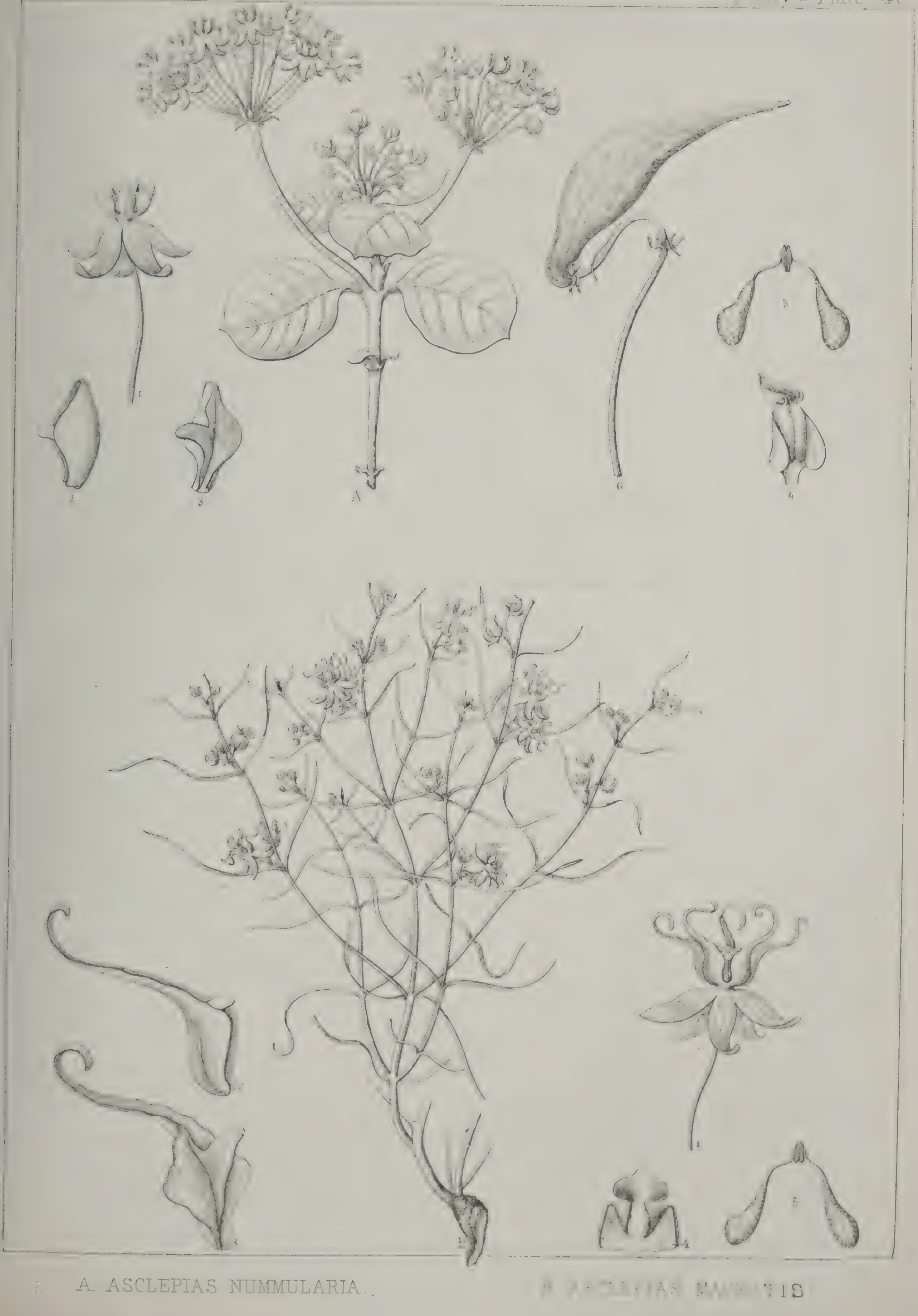
ERYTHRÆA CHIRONIOIDES T.



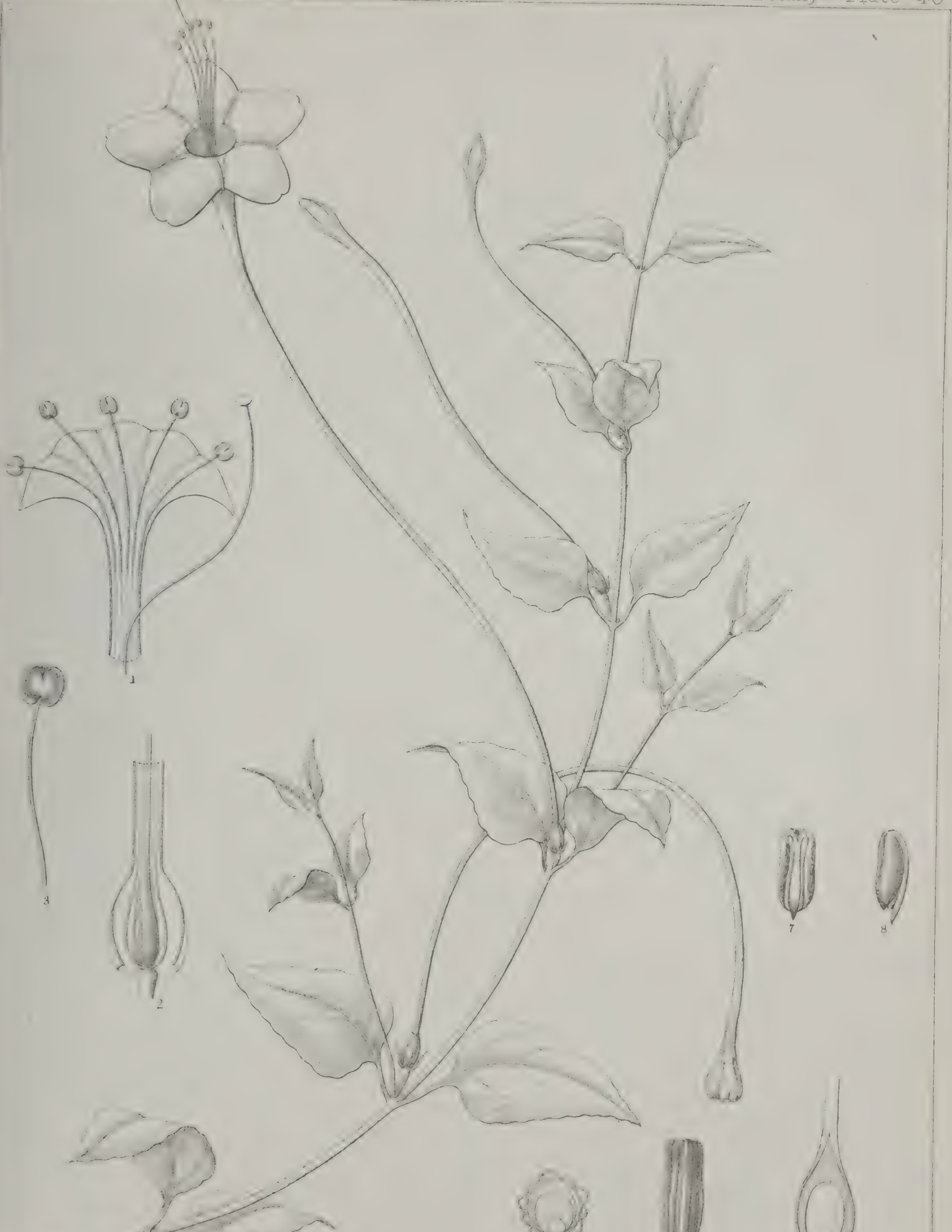
ECHITES MACROSIPHON.



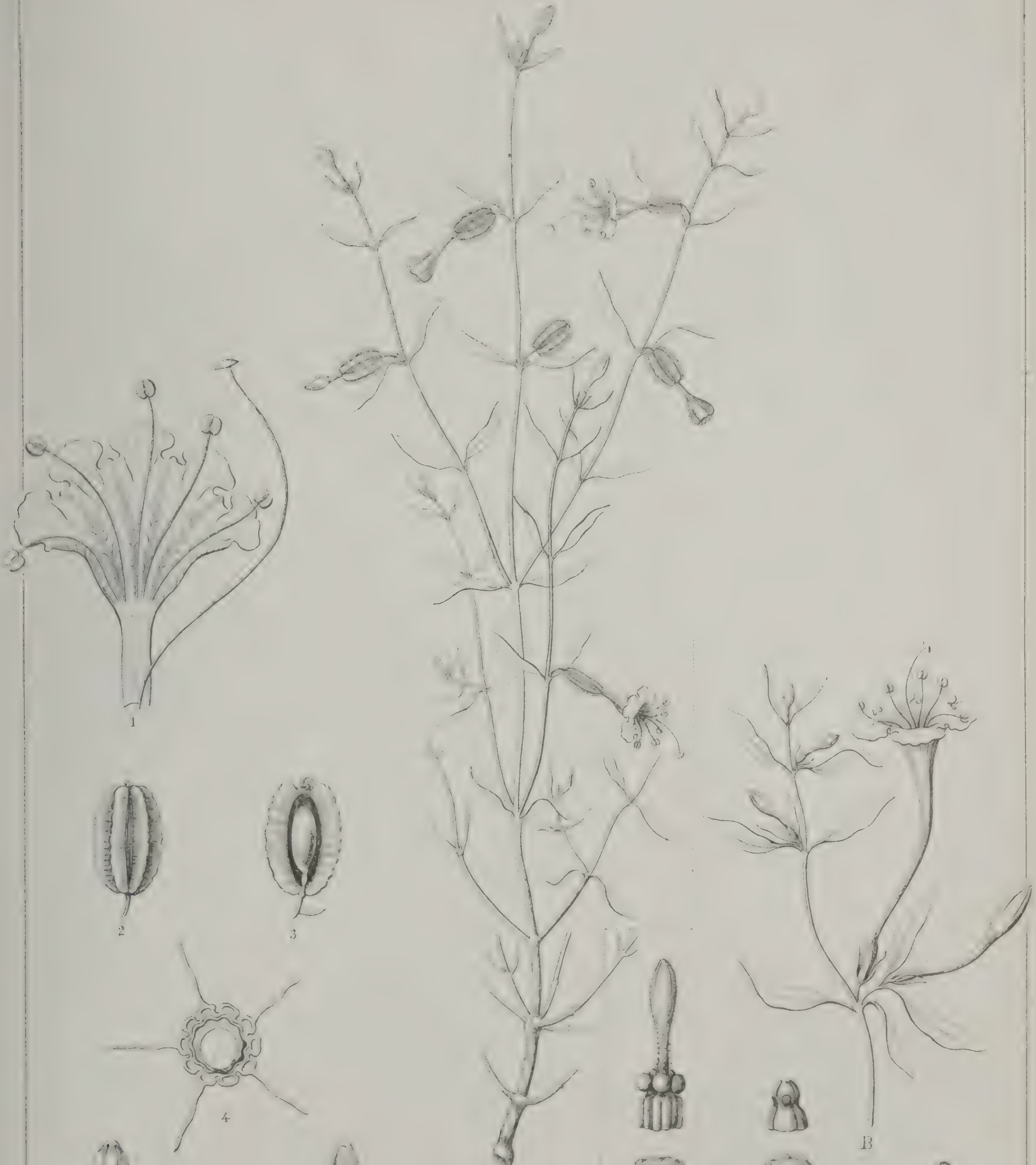
ASCLEPIAS TOMENTOSA



P. A. ASCLEPIAS NUMMULARIA. B. ASCLEPIAS MACROTIS

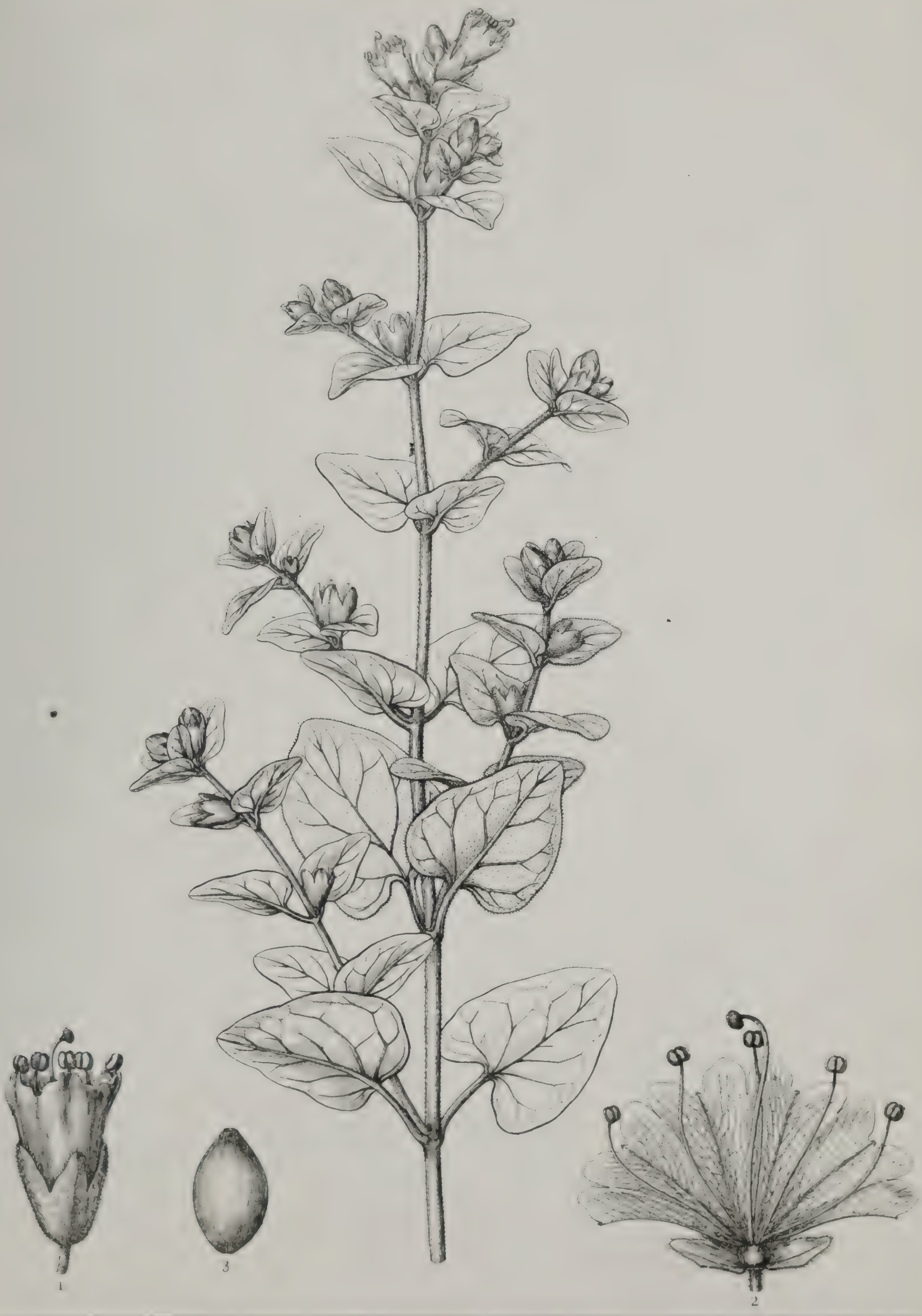


ACLEISANTHES LONGIFLORA.

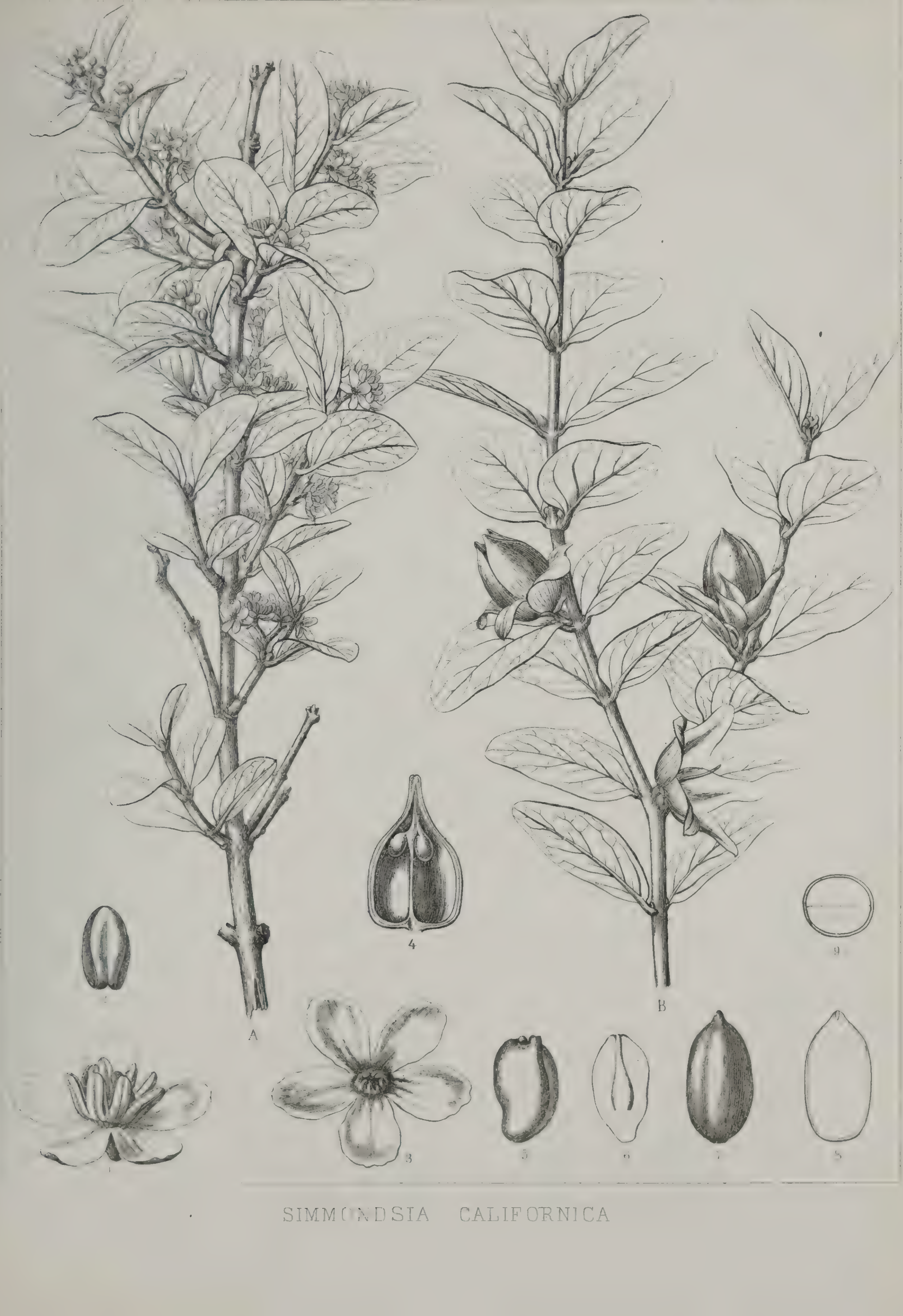


SELINOCARPUS ANGUSTIFOLIUS.

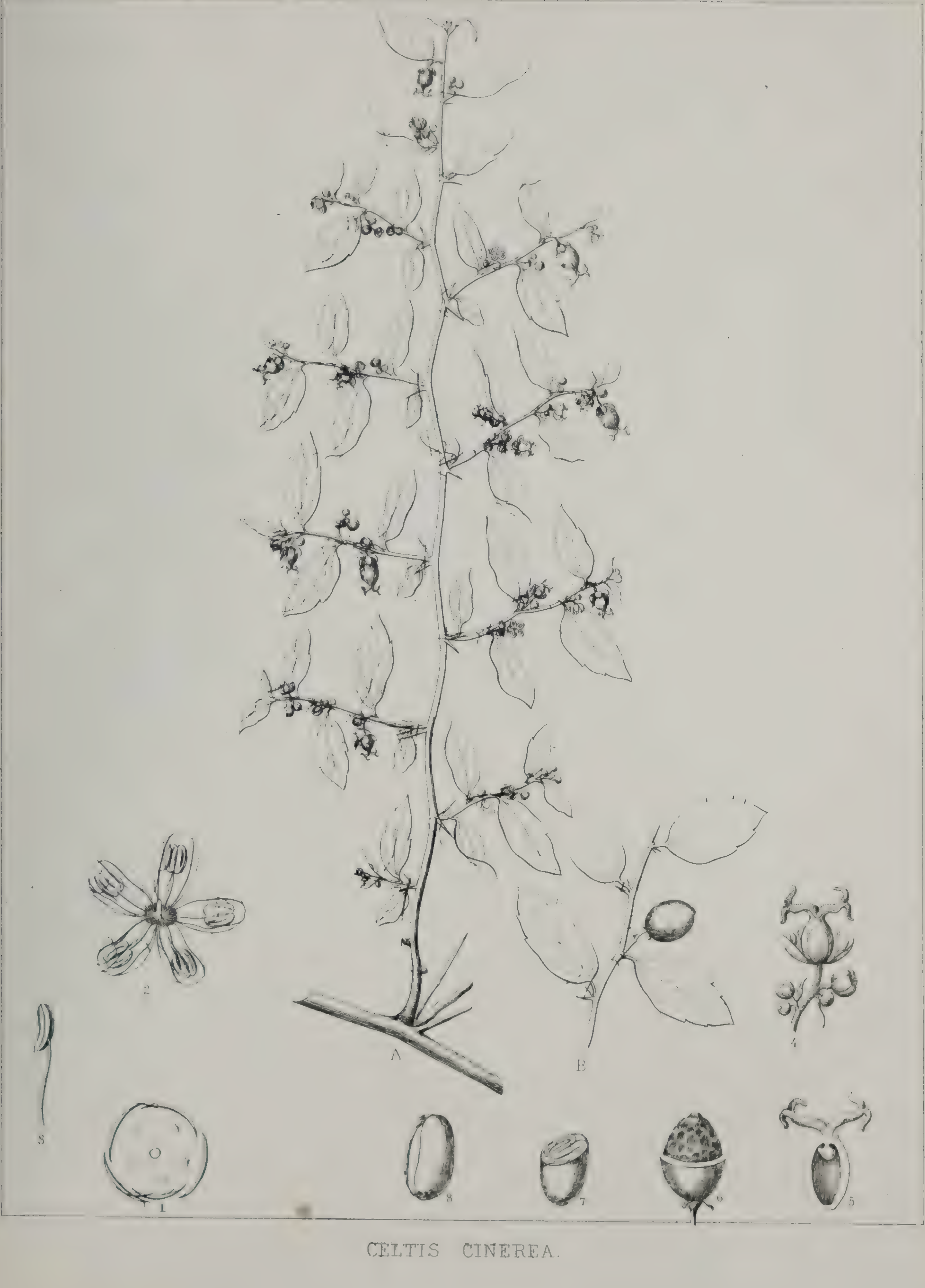
PENTACROPHYS WRIGHTII.



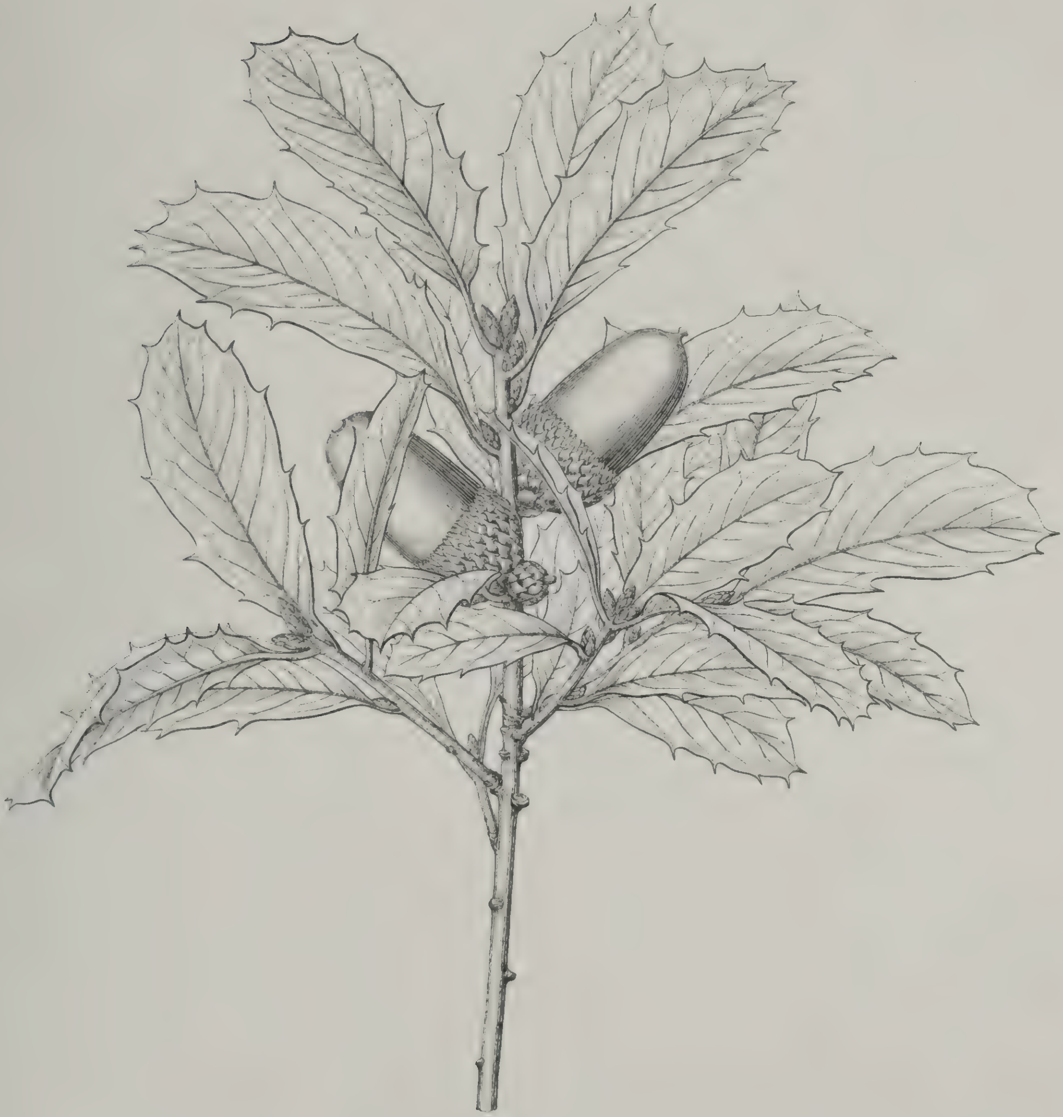
MIRABILIS CALIFORNICA



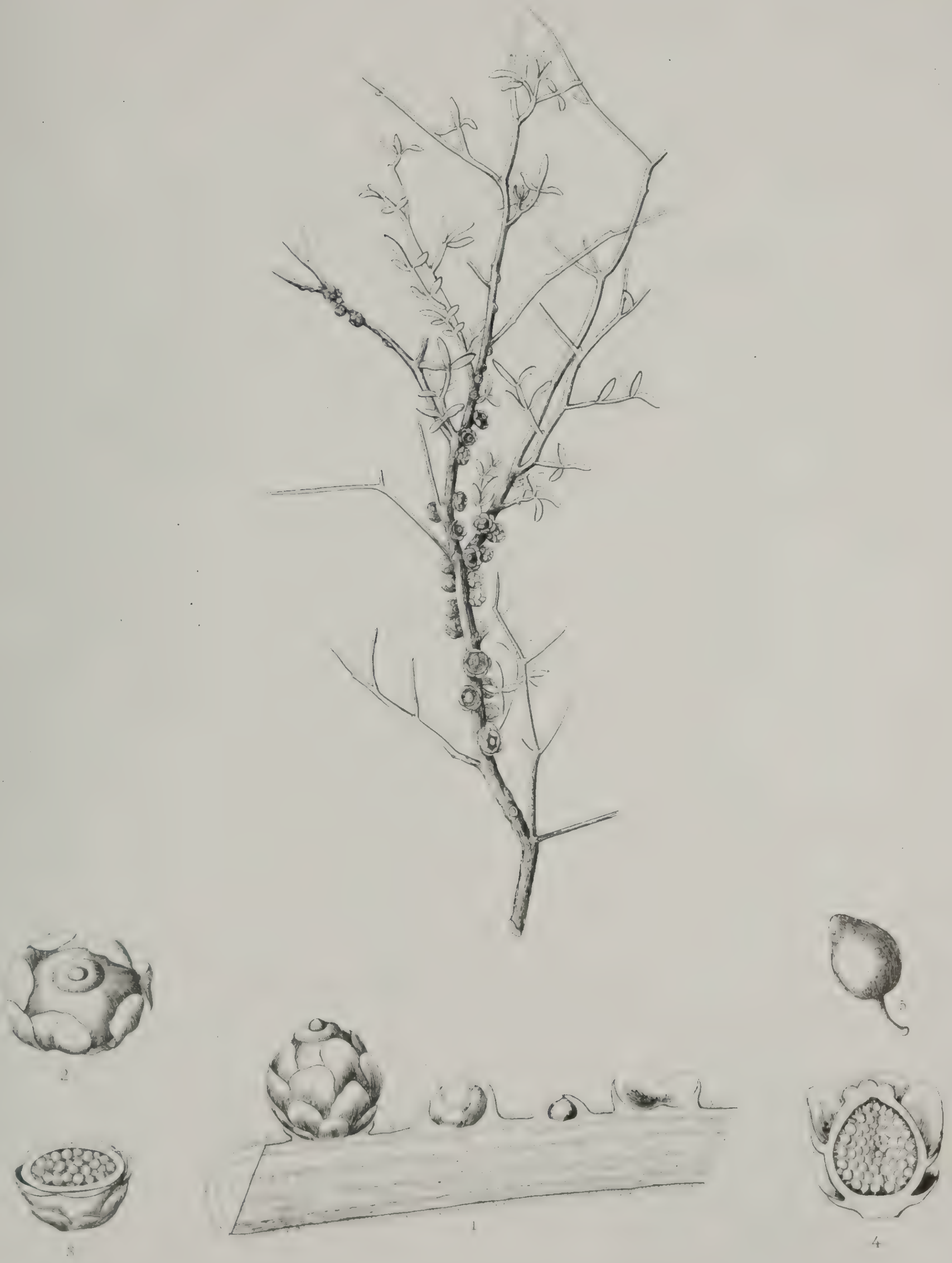
SIMMONDSIA CALIFORNICA



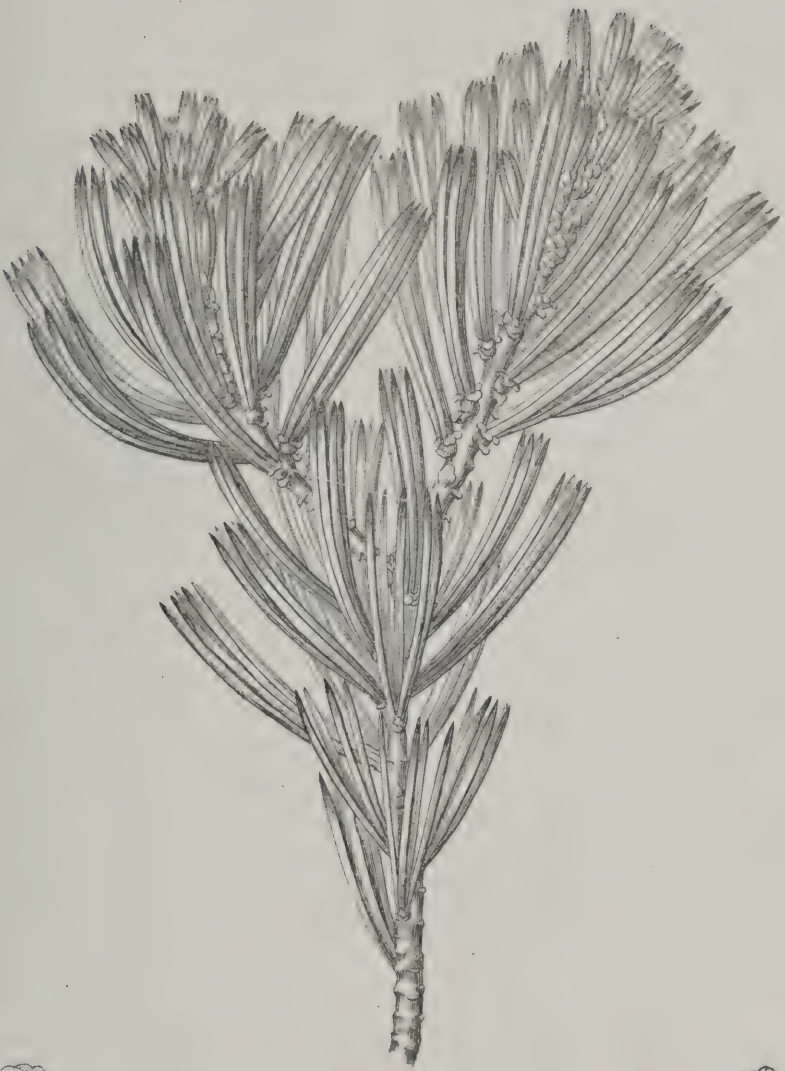
CELTIS CINEREA.

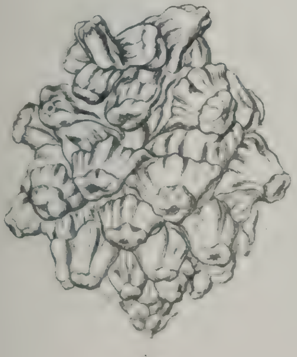


QUERCUS ACUTIDENS.



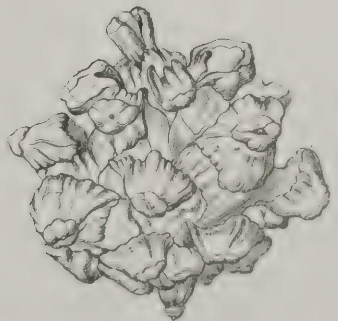
PILOSTYLES THURBERI





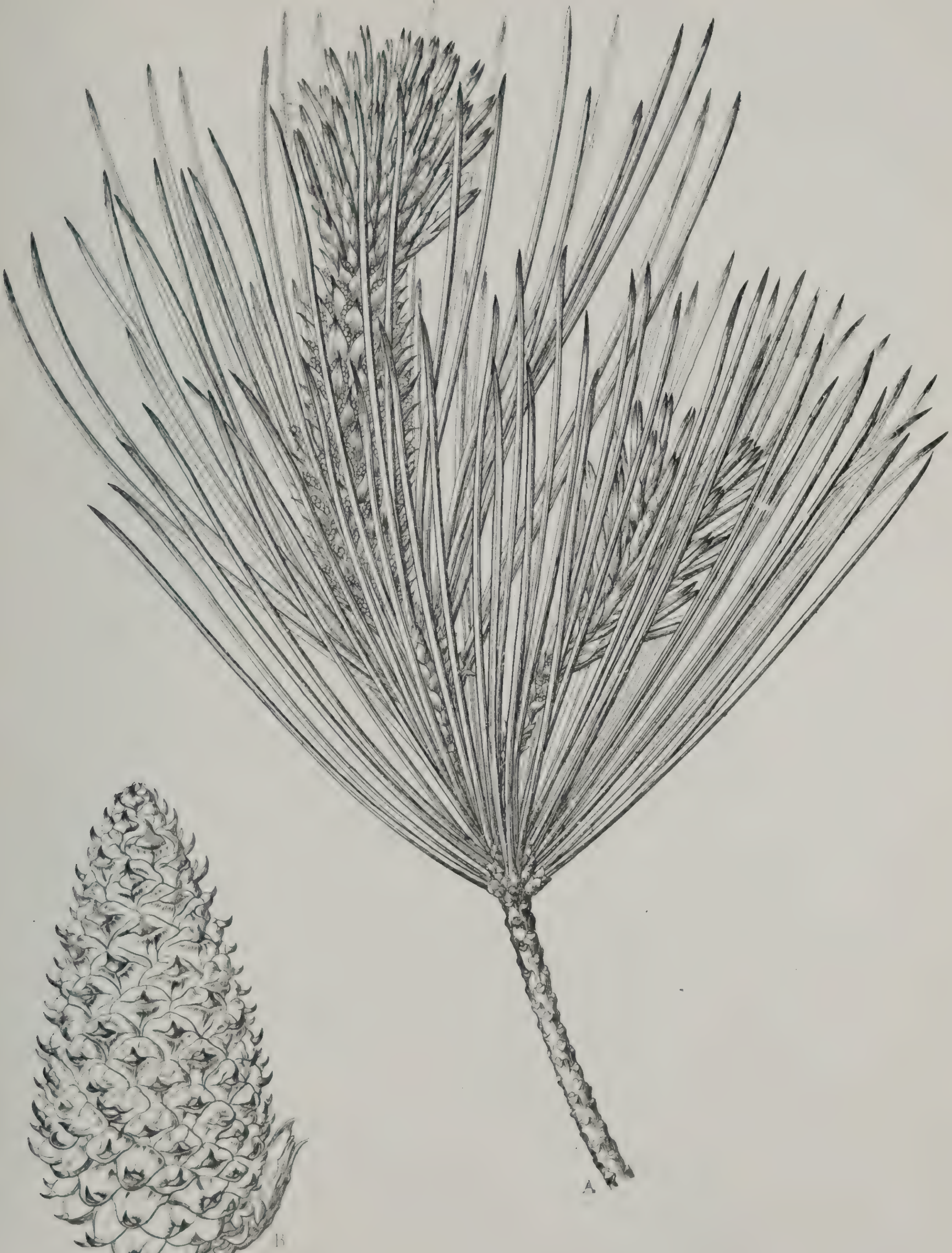
1

3

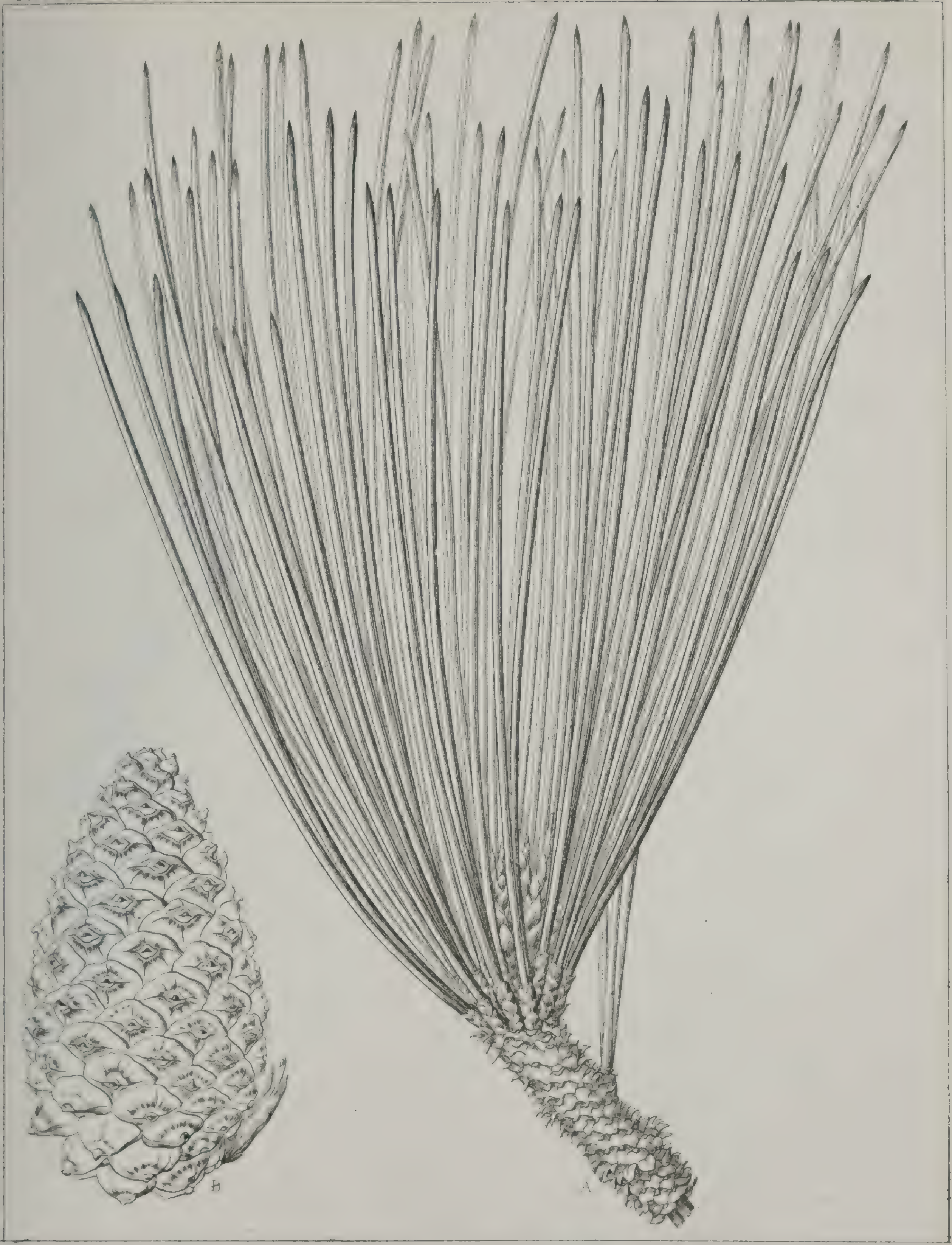


2

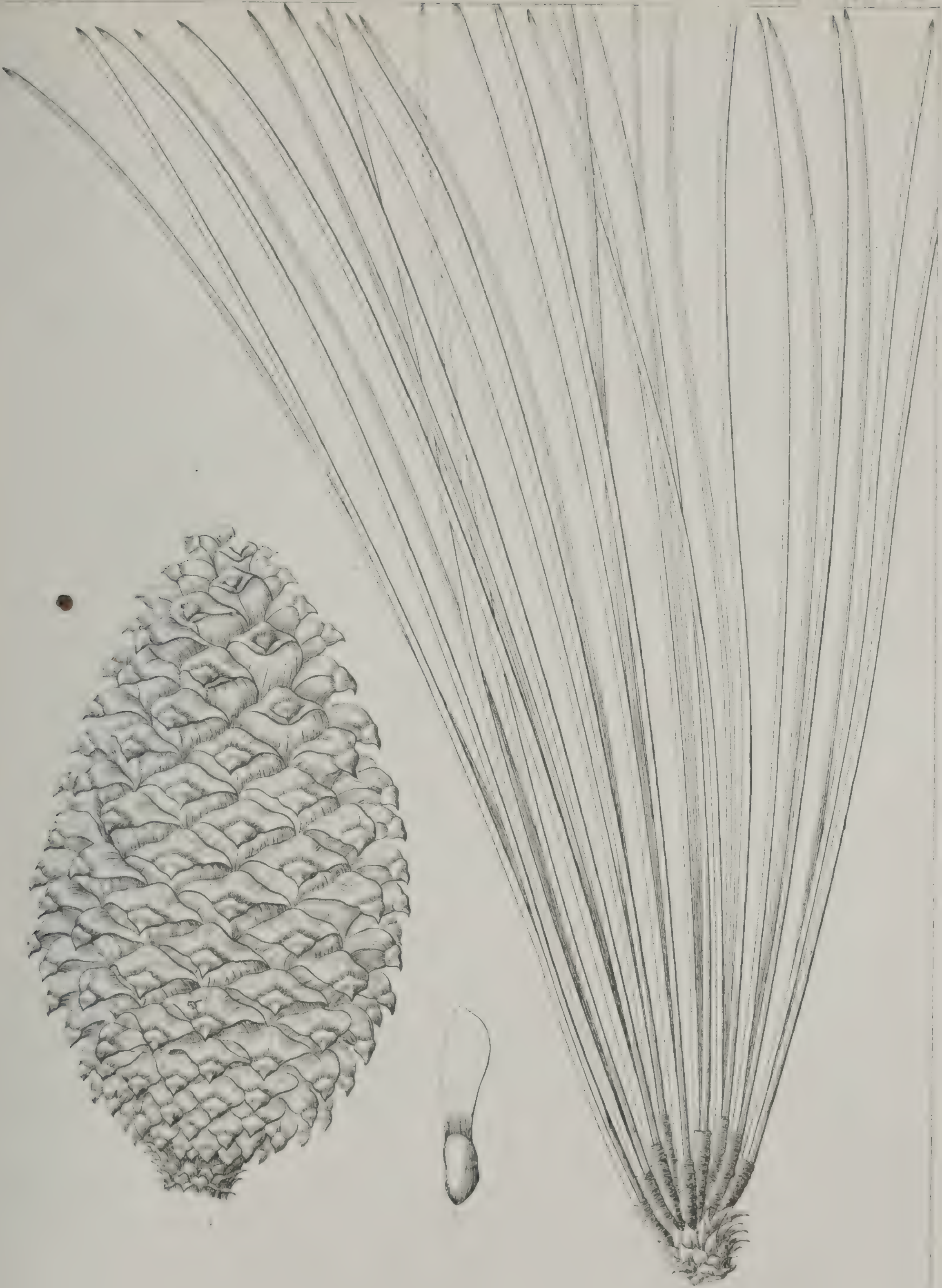
PINUS LLAVEANA



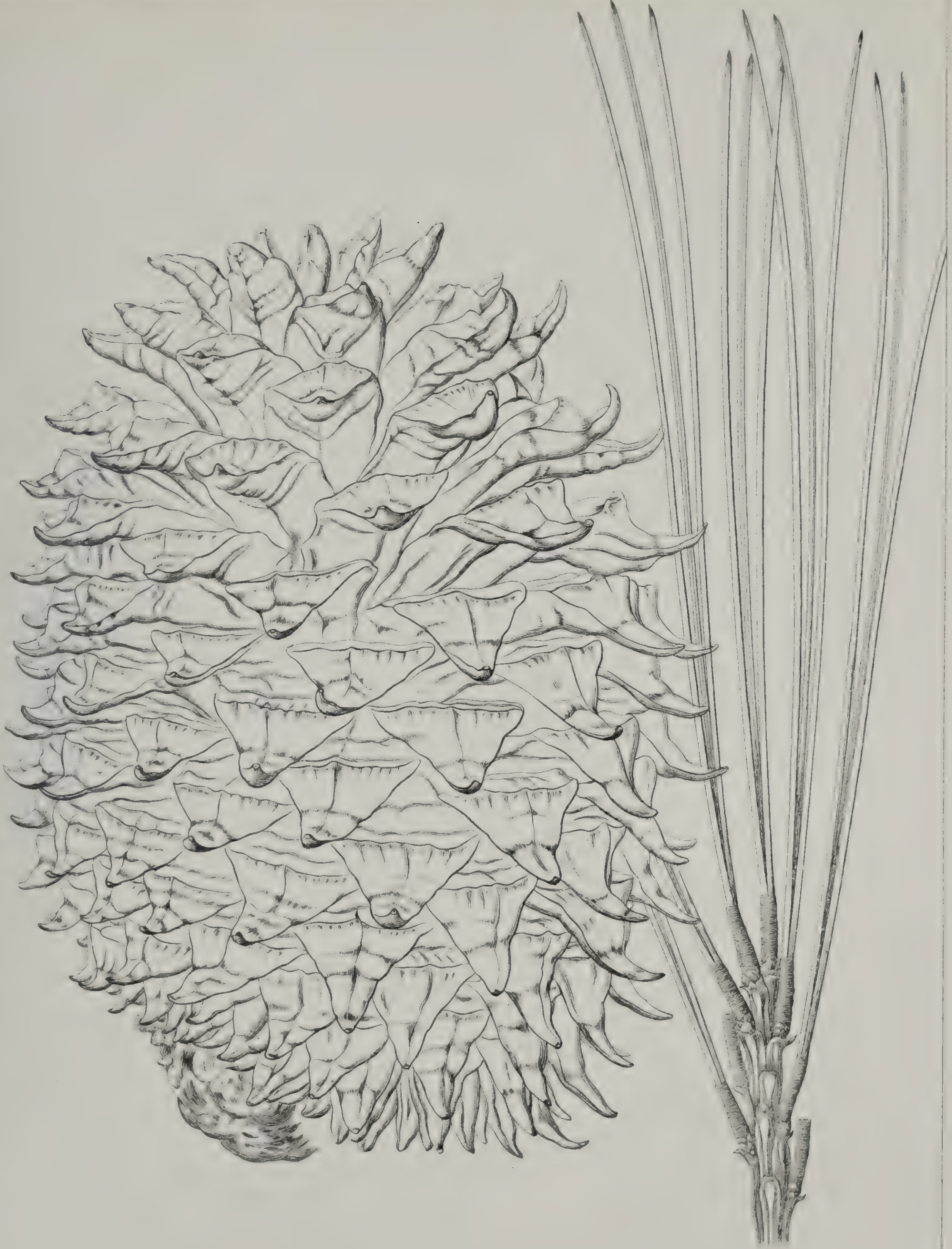
PINUS TORREYANA



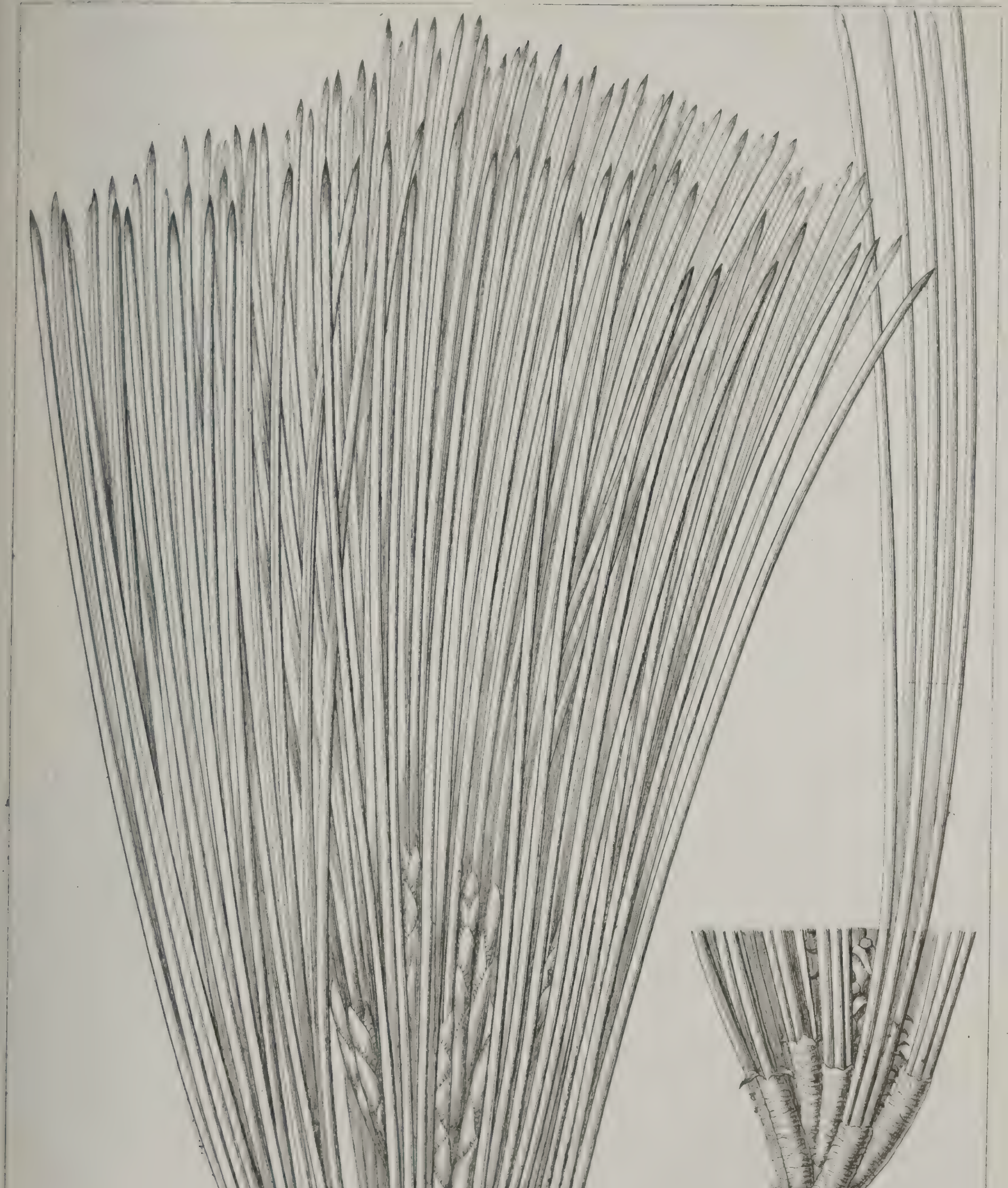
PINUS INSIGNIS.

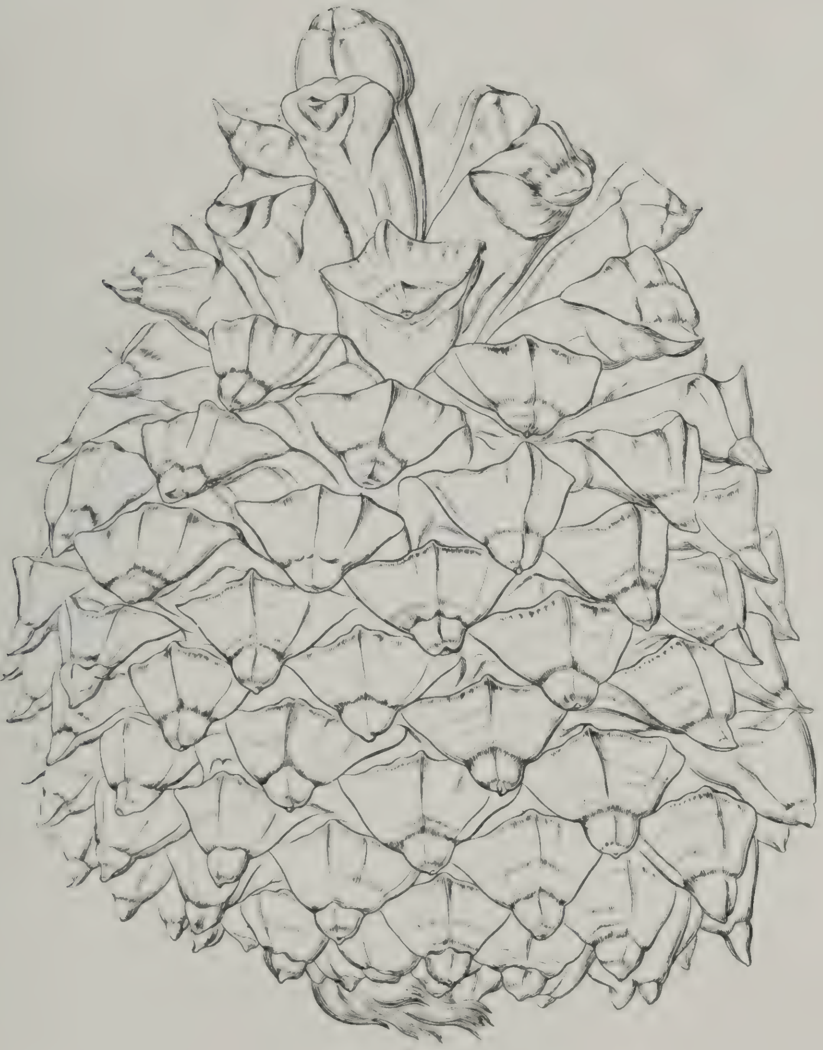


PINUS [illegible]

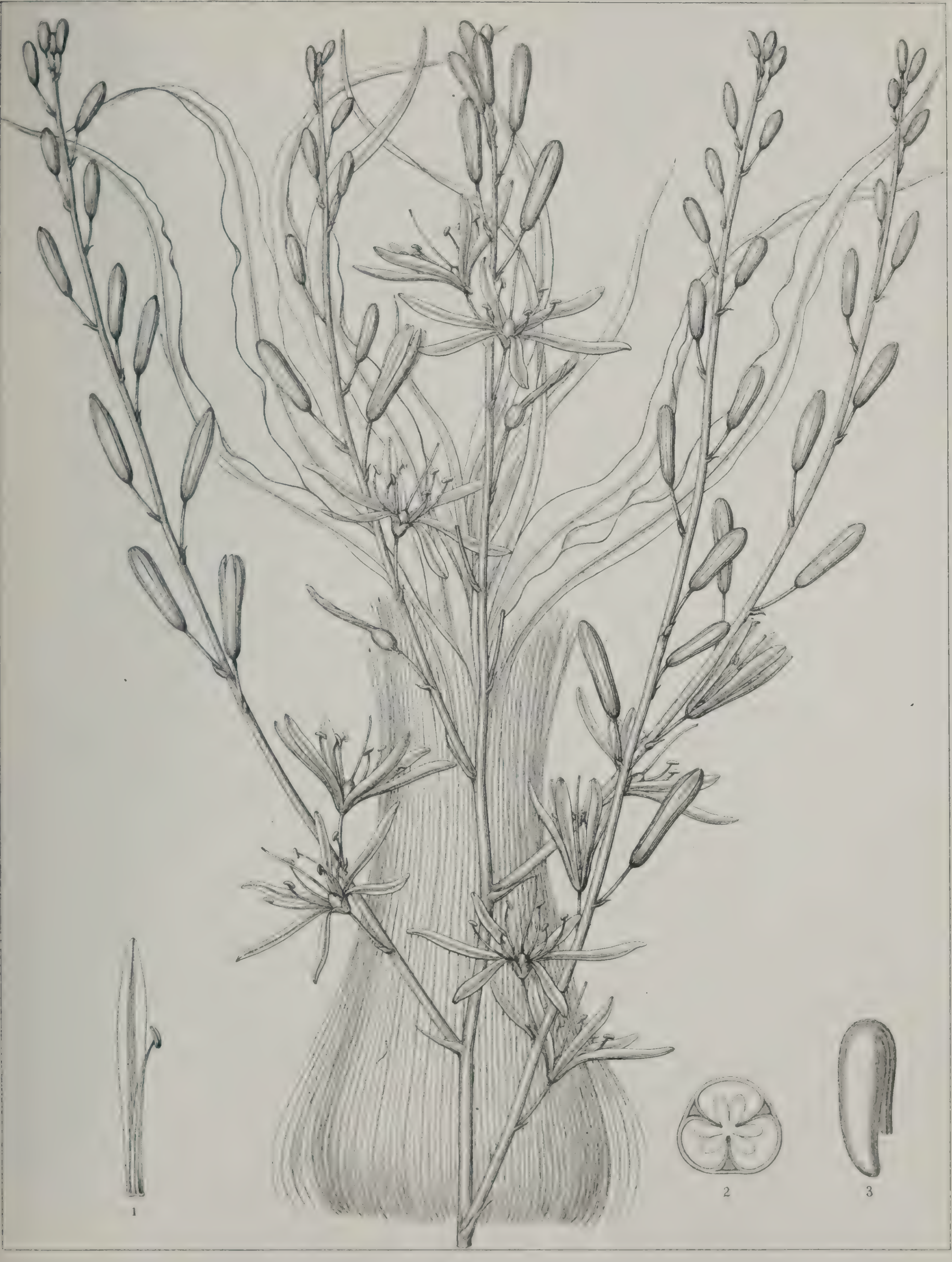


PINUS SABINIANA.

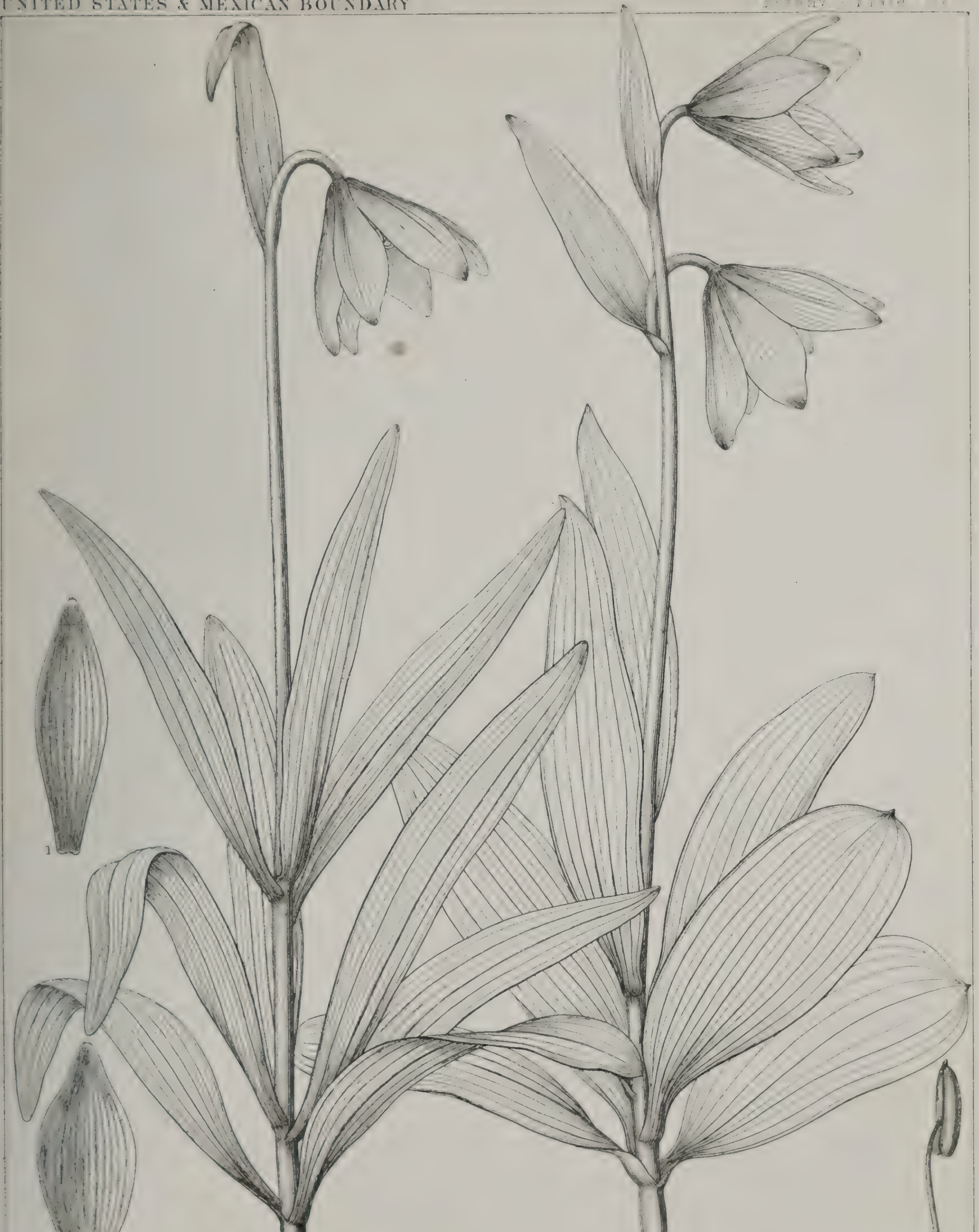




PINUS TORREYANA



CHLOROGALUM POMERIDIANUM.



FRITILLARIA LANCEOLATA.

UNITED STATES AND MEXICAN

BOUNDARY SURVEY,

UNDER THE ORDER OF

LIEUT. COL. W. H. EMORY,

MAJOR FIRST CAVALRY, AND UNITED STATES COMMISSIONER.

CACTACEÆ

OF THE BOUNDARY,

BY

GEORGE ENGELMANN, M. D.,

OF ST. LOUIS.

CACTACEÆ.

I. MAMILLARIA, Haw.[*]

Subgen. 1. EUMAMILLARIA.

Plantæ simplices seu cæspitosæ, tuberculatæ, aculeigeræ.

Tubercula plus minus teretia seu angulata, nunquam sulcata.

Areolæ floriferæ axillares, ab areolis aculeiferis penitus distinctæ, nudæ seu villosæ, nunc setosæ.

Flores ex axillis tuberculorum anni prioris antecedentiumve orti, plerumque parvi inconspicui.

Ovarium plerumque immersum: bacca versus maturitatem solum (anno secundo in plurimis) emergens, fere semper clavata, coccinea.

Semina minuta, plerumque rugulosa seu scrobiculata, rarissime verruculosa, vix lævia, fulva, fusca, seu nigra.

Most *Mamillariæ*, heretofore known and cultivated, belong to this subgenus, which is well characterized by the lateral position of the flowers.

1. M. MICROMERIS (sp. nov.): parvula, simplex, globosa; vertice depresso; tuberculis minimis verrucæformibus confertissimis; areolis solum junioribus lana laxa longa vestitis; aculeis plurimis pluriserialibus minutis ex albido cinereis, in plantis junioribus et in tuberculis inferioribus plantarum adultarum sub–20 æqualibus lineam longis radiantibus, in tuberculis floriferis (verticem plantæ adultæ versus) 30–40 stellato-porrectis, superioribus 6–8 cæteros bis terve superantibus versus apicem clavatis acutis, parte superiore demum deciduo; floribus minimis subcentralibus; sepalis petalisque 5; stigmatibus 3 stamina æquantibus; bacca elongata clavata coccinea floris rudimenta dejiciente; seminibus paucis oblique obovatis basi acutis nigris lucidis sub lente levissime verruculosis, hilo elongato ventrali.[†] (Tab. I and II, fig. 1–4.)

---

[*] I leave the character of the genus as heretofore generally circumscribed. Lemaire's genus *Anhalonium*, however, a species of which is found in our territory, in my opinion cannot be separated from *Mamillaria* so long as the generic character is founded on the organs of fructification, and not on the external shape of the plants. The expression "*Inflorescentia verticalis*," which I use in relation to the subgenera *Coryphantha* and *Anhalonium* and to the genus *Echinocactus*, although in common use, is not strictly correct: the flowers appear on the vertex of the plant, indeed, but not as the prolongation of the main axis; they are, as in all Cactaceæ, properly lateral, but produced by the young growth of the same year, while in all other Cactaceæ they spring from the growth of the preceding or former years, and, consequently, make their appearance more or less on the side of the plant, or, if on the top, only on older branches or joints.

[†] I look at the seed always in such a position that the radicle of the embryo points downward and the cotyledons upward, or when curved, upward and forward, or to the left. All the seeds figured in this Report are represented in this position, unless otherwise stated. We have then one *side* or *face* (produced by the always more or less distinct compression of the seed) towards the beholder, the *base* below, and the *ventral* part or edge of the seed to the left, and the *dorsal* part to the right.

The hilum is large or small, circular, oblong, oval, or elongated, mostly more or less basal, but not rarely sub-ventral or ventral; it is usually surrounded by a tumid rim, formed by the thickened testa, smoother than the other parts of the seed. The albumen, when present, or the trace of it, which is indicated by a never-wanting thickening of the endopleura, is always found, on the ventral part of the seed. The back or dorsal part of the seed is often more or less carinate, especially towards the base. The testa of the seed is pergamentaceous, yellowish, or brownish, or black; or it is hard, crustaceous, and then always black; or it is whitish and thick and bony (only in *Opuntiæ*.) The surface of the seed is smooth, often shining, or it is rugose, or pitted, or

Var. β. Greggii: major, tuberculis globoso-ovatis paullo majoribus; aculeis rigidis 2–3-seriatis, interioribus 5–7 brevioribus robustioribus, exterioribus 15–18 paullo longioribus, omnibus radiantibus; seminibus paullo minoribus leviter verrucosis. (Tab. II, fig. 5–8.)

From El Paso to the San Pedro river, also in a single locality east of this river, in naked places on mountain-tops or sides, only on limestone, never in the porphyritic region, *C. Wright.* Var. β. was collected by the late *Dr. J. Gregg* on a mountain-ridge between Azufrora and Penos Bravos, near Saltillo, Mexico.—Small globose plants, depressed at top, simple, or very rarely (and probably only after an injury to the top of the main plant) branching; heads usually ½ to 1 inch in diameter, in largest specimens seen 15–18 lines in diameter; plants densely covered by the delicate ashy-grey spines; tubercles about ½ line long, only 1–1¼ lines distant from one another; older ones shedding the spines, and giving the base of the plant a very pretty tuberculated appearance; in the larger plants 21 or 34 spiral rows of the tubercles are the most distinct; spines not pungent, in several series, usually about one line long; on the younger tubercles of the fully-developed plant, (those I suppose which may bear flowers in their axils,) the 6–8 upper exterior spines are 2–3, or sometimes even 4 times as long as the other spines, (2–4 lines long,) thickened or clavate towards the end, with an acute point; these spines are the first to appear in the nascent tubercle, (as indeed is the case in all *Mamillariæ* where the uppermost radial spines are always developed before the others,) mixed with loose wool of almost the same length. These elongated superior spines form a small tuft in the vertex of the plant, which includes and partly hides the flowers and fruit. When they get older, apparently after the second or third year, the upper part of these long spines breaks off, leaving them of the same length as the others, but always distinguishable by their ragged end. These peculiar spines, of which I have not seen any analogy in other species, are wanting in younger plants.

The position of the flowers in this plant is rather a doubtful one. I have not seen living specimens in flower, but the structure of the tuft, the position of the berries in the dead specimens before me, and the note of Mr. Wright, "flowers central" would seem to indicate that they really appear in the new growth of the same season. In that case this species would be an anomalous small flowered and small tubercled *Coryphantha.* But I am yet inclined to consider the flowers as only *nearly central,* and borne in the axils of the last tubercles of the preceding season; all the analogies at least are in favor of our plant being a true *Mamillaria.* Flowers reduced to the simplest type of *Cactaceæ,* viz: 3–5 sepals, about 5 petals, two or three times as many stamens, and a style with 3 stigmata; diameter of flower about 3 lines; petals whitish or very light pink; fruit an elongated clavate red and somewhat juicy berry, 4–6 lines in length, without the remains of the flower on top, somewhat persistent on the plant, finally shrivelling up, obovate, grey, and hid in the tuft; so it is found in the specimens brought home. Seeds only 6–12 in each fruit, comparatively large, 0.7 line long, 0.5 in diameter, with a very large umbilicus; testa hard and brittle, though thin.

Var. *Greggii* is larger and coarser in all its parts. The specimens before me are 1–2 inches in diameter; tubercles 1–1¼ line long; exterior spines 1½–2 lines, interior stouter ones ½–1 line long. The 6–9 upper elongated spines on the younger tubercles are 3–4 lines long,

---

covered with very minute or larger warts or tubercles; these tubercles are distinct, or more or less concatenate or confluent, leaving irregular pits in their interstices. Smooth or pitted seeds I find in most *Mamillariæ* and *Echinocacti,* irregularly rugose ones in some *Echinocacti* and *Cerei,* tuberculated seeds only in *Anhalonium,* the single *Echinocactus setispinus,* and all *Echinocerei,* while the species of the other sections of *Cereus* known in our Flora generally have smooth seeds. Of the quite peculiar, large, flat, and bony seeds of *Opuntiæ,* I shall find occasion to speak hereafter.

thicker at base, very slender in the middle, and thickened again towards the very acute point. Fruit about 9 lines long; seed smaller than in the more northern form, 0.6 line in length and more distinctly tuberculated.

Mamillaria microthele, Muhlenpf., seems to be closely allied to our plant, but is distinguished (to judge from the descriptions) by its cespitose growth, and its distinct 1 or 2 central spines. No allusion is made in the descriptions to the remarkable vertical tuft, though the small pale rose-colored flowers are mentioned. The name, *M. micromeris*, refers to the smallness of all the parts of this species.

2. M. LASIACANTHA (sp. nov.): parvula, simplex, globosa seu ovato-globosa; tuberculis cylindricis læte viridibus; axillis nudis; areolis junioribus albido-lanatis; aculeis 40–80 pluriseriatis omnibus radiantibus maxime inaequalibus brevibus setiformibus albis rectis seu paullo recurvatis ciliato-pilosulis vel denudatis; floribus lateralibus parvis; sepalis 13 obtusis, exterioribus mucronatis; petalis 13 fere uniseriatis oblongis obtusis emarginatisve; stylo stamina brevia longe superante; stigmatibus 4–5 ovatis brevibus erectis convergentibus; bacca elongata clavata coccinea; seminibus numerosis obovato-subglobosis scrobiculatis nigricantibus, hilo basilari ovali.

Var. *α*. MINOR: caule minore ovato; aculeis paucioribus brevioribus dense pilosulis. (Tab. III.)

Var. *β*. DENUDATA: caule majore globoso; aculeis plurimis longioribus subnudis. (Tab. IV.)

About Leon spring and Camanche spring, west of the Pecos, on low limestone hills, among herbage, *C. Wright:* fl. April and May.—A pretty little species, covered with and almost entirely hidden under the innumerable soft, more or less pubescent spines. The smaller form is 9–12 lines high and 6–9 lines in diameter; tubercles in 8 or 13 spiral rows, 2 lines long and nearly 1 line in diameter; areolæ 1½ line distant from one another. Spines 40–60, 1½–2 lines long, the upper exterior ones a little longer than the rest, the innermost ones often not half as long as the others. The larger form, var. *β*, is 1–1½ inch high, and of almost the same diameter; tubercles 2½–3 lines long, in 13 or 21 spiral rows; spines 50–80 almost, or the old ones entirely naked, 1½–2½ lines long, the innermost usually much shorter. The flower is half an inch long, and, when fully open, of the same diameter; petals white, with a red streak in the centre, which at base forms a red circle around the yellow stamens; style yellowish, with 4 or 5 yellowish-green stigmata, which form together a short globose head; fresh fruit 6–10 lines long, without the remains of the flower, somewhat persistent and finally shrivelled up, greyish, obovate-clavate, deeply imbedded and hid between the tubercles; seeds 10–25 in each fruit, smaller than in the last species, and altogether different in shape and surface, about 0.5 line long, very conspicuously pitted, hard and brittle. I have named this species *M. lasiacantha* from the usually very soft pubescence of the spines. It is evidently closely allied to *M. Schiedeana*, Ehrenb.; but this is a much larger plant, with larger tubercles, very woolly axils, and its spines tipped by a silky brush. Both this and the last species belong to Prince Salm's § 3. *Polyacanthæ* ** *aculeis patentissimis adpressis*. The position of the flower, however, seems to indicate that they are widely separated from each other, though the external appearance of the plants is very much alike.

3. M. PUSILLA, DC., var. TEXANA: ovato-globosa, prolifera, cæspitosa; tuberculis teretibus versus apicem conicis, axilla longe-lanatis setosisque; aculeis pluriseriatis, extimis numerosissimis (30–50) capillaceis elongatis flexuosis vel crispatis albis, interioribus 10–12 sensim ri-

gidioribus brevioribus rectiusculis puberulis albidis, intimis 5–8 longioribus rigidis rectis pubescentibus basi bulbosis infra albidis sursum rufis fuscisve inaequalibus; florum lateralium ovario subemerso; sepalis 9–12 oblongo-linearibus obtusiusculis tenuiter fimbriatis; petalis 13–16 fere uniseriatis oblongo-linearibus obtusis vel emarginatis saepe mucronatis; stigmatibus 5 flavidis longe supra stamina exsertis; bacca elongata clavata s. subcylindrica coccinea floris rudimentis involutis coronata; seminibus plurimis obovatis scrobiculatis nigris lucidis, hilo basilari lineari. (Tab. V.)

From Eagle Pass to Santa Rosa, *Dr. Bigelow*, and, according to *Dr. Poselger*, common on the Rio Grande below: fl. March to May.—Heads 1–1½ inch in diameter, 1–2½ inches high, usually covered below with young branches, and finally densely cespitose; tubercles 3½–4½ lines long, dark-green; axillæ quite woolly, with several coarse twisted bristles mixed with the wool; exterior hair-like spines covering the whole plant as with a coarse wool, often 6–8 lines long, when straightened; interior spines slender, but stiff and pointed, 3–4 lines long, in young or weakly specimens, whitish, with dark tips, in robust ones yellow at base, brown upwards, and almost black at tip; flowers 7–10 lines long; petals dirty yellowish-white, with a reddish streak in the middle; fruit about 9 lines long; seeds 0.6 line long, hard and brittle, very similar to the seed of the last mentioned species, only a little larger and with narrow hilum.—*Mamillaria pusilla*, from the West Indies, is so near our plant that this one must necessarily be referred to it; the only difference seems to consist in the smaller number of radial spines (12–20) in *M. pusilla*, and in the greyish-green color of its tubercles.

4. M. PHELLOSPERMA (M. tetrancistra *E. partim, in Sill. Journ. Nov.* 1852): ovata seu ovato-cylindrica, simplex seu rarius e basi ramosa; tuberculis ovato-cylindricis; axillis lanatis setigeris demum nudis; aculeis radialibus numerosissimis (40–60) biseriatis, exterioribus tenuioribus brevioribus albis, interioribus robustioribus longioribus apice fuscatis, centralibus 3–4 robustioribus longioribus ex basi pallidiore atrofuscis, superioribus 2–3 rectis seu uno pluribusve hamatis, inferiore validiore sursum hamato; floribus versus plantæ apicem lateralibus; sepalis 15–17, exterioribus ovatis obtusiusculis ciliatis, interioribus oblongo-linearibus; petalis sub-12 acuminato-aristatis; stigmatibus 5; bacca obovato-clavata late umbilicata corollam marcescentem dejiciente tenui coccinea vix pulposa; seminibus magnis globosis rugosis, ad hilum-massa suberosa semine ipso majore triloba fusca arilliformi auctis. (Tab. VII.)

Dry gravelly hills about the base of the mountains east of the Californian Cordilleras, near San Felipe, *Dr. Parry;* also on the lower Gila, *Dr. Le Conte, A. Schott;* on the lower Colorado, the Mojave, and east of the Colorado towards the Cactus Pass, *Dr. Bigelow.*—This interesting species was first noticed by Dr. Parry, and was described from his notes in Silliman's Journal l. c., under the name of *M. tetrancistra.* Specimens brought home since by several collectors leave no doubt that this and several other species had been confounded; and, moreover, that hardly ever all the four central spines are hooked. The original name had therefore to be altered; the one selected for it indicates the peculiar corky structure of the enlarged base of the seed.

Our species is often simple, not rarely several stems are seen coming from one base, or an older stem bears young branches at its lower part; young stems almost globose, older ones ovate, and even cylindric, 2 to 4 or 5 inches high, 1½ or 2 inches in diameter; tubercles 4–7 lines long, not so much crowded as in the allied species, in 8, or at most, 13 spiral rows. The axils of the young tubercles produce loose wool, with a few long spiny bristles, which disappear only after several years. In the smallest specimen before me I find 14–18 exterior radial spines, 4–5 lines long, and 12–16 interior ones, 5–6 lines long; in other specimens I have counted from 50–60 radial spines. The upper central spines in my specimens are mostly 5–7 lines long; sometimes I find 1 or 2 of them longer and hooked, and sometimes all 4 are said to be regularly hooked; the lower central spine is stouter and longer than the others, 6–9 lines long, with the sharp hook always turned upwards. Flower apparently about an inch long; fruit clavate or pear-shaped 6–12 lines long, and 4–6 lines in diameter, with a thin scarlet-colored integument, torulose from the protrusion of the large seeds; the withered flower falling off leaves a wide circular umbillicus; seeds large, visible through the thin pericarp, attached to conspicuous white funiculi; seed proper 0.6 or 0.7 line in diameter, with the appendage 1.2—1.5 line long. The curious spongy or corky appendage is larger than the seed itself, and buries its lower part as it were in a bluntly 3-lobed cup. Embryo almost globose, 0.6 line long, 0.5 line in diameter; cotyledons small but perfectly distinct and visible; no albumen.—Apparently near *M. ancistroides*, Lem., with 30–40 radial and 4–5 central spines, flower and fruit unknown; the radial spines are said to be homogeneous, and the axils naked.

5. M. GRAHAMI (sp. nov.): globosa seu demum ovata, simplex seu e basi ramosa; tuberculis ovatis basi dilatatis axillis nudis; areolis orbiculatis seu ovato-orbiculatis; aculeis radialibus uniseriatis 15–30 albis saepe apice fuscatis nudis seu puberulis, summis brevioribus, lateralibus longioribus; aculeo centrali singulo robustiore longiore sursum hamato, saepe 2 rectis sursum divergentibus adjectis, omnibus e basi pallidiore fusco-atris; floribus sub vertice lateralibus rubicundis; sepalis sub–13 lineari-oblongis obtusiusculis ciliolatis; petalis sub 13 lineari-oblongis roseatis, exterioribus mucronatis, interioribus obtusis retusisve; stylo stamina brevia longe superante; stigmatibus 6–8 elongatis filiformibus suberectis; bacca ovata (viridi?) floris rudimentis coronata; seminibus oblique obovatis scrobiculatis nigris. (Tab. VI, fig. 1–8.)

Mountainous regions from El Paso, *Charles Wright*, southward and westward to the Gila, *Dr. Parry*, and Colorado, *A. Schott*, and up this latter river as far as Williams' river and Cactus Pass, *Dr. Bigelow*: fl. from June or July to August.—Stems 1–3 inches high, 1–2½ inches in diameter, simple or somewhat branching from the base, and thereby sometimes slightly cespitose; tubercles 3 lines long, and when old of a corky texture, persistent when dead and dry like those of *M. tuberculata*, disposed in 13 or 21 spiral rows. Radial spines in some smaller specimens 25–30, in larger ones often only 20–25, and in some Sonora specimens only 15–18 in number; the lateral ones are the longest, about 3–4 lines, or in the largest specimens even 5-6 lines long; lower spines shorter, upper ones the shortest and most slender. In smaller specimens only one central spine is observed, generally much longer than the radial spines, 3–9 lines long, with a wide or sometimes a narrower hook, always curved upward. In many specimens one or two upper spines are found, neither so stout nor so long as the lower hooked one, and always straight; flower 9–12 lines long, rose-colored; fruit a small oval berry, about half an inch long, apparently green when ripe; seeds among the smallest in this genus, only 0.4 or rarely 0.5 line long, slightly pitted, with a small and narrow hilum.—This pretty species has been named for *Col. J. D. Graham*, of the United States Corps of Topographical Engineers, under whose auspices many of these species were collected.

6. M. WRIGHTII (sp. nov.): globosa seu depresso-globosa, basi obconica, simplex; tuberculis teretibus; axillis nudis; aculeis radialibus sub-12 albidis summis 3–5 paullo robustioribus apice fuscatis, lateralibus sublongioribus, inferioribus gracilioribus; aculeis centralibus plerumque binis divergentibus uncinatis fusco-atris radiales subæquantibus; floribus lateralibus (?); sepalis exterioribus 13 triangularibus obtusiusculis fimbriatis, interioribus 8 acutis margine

petaloideis; petalis 12 lineari-lanceolatis acuminatis aristatis purpureis; bacca majuscula ovato-globosa succosa purpurascente floris rudimentis coronata; seminibus obovatis basi acutis nigris scrobiculatis, hilo subventrali parvo angusto. (Tab. VIII, fig. 1–8.)

New Mexico, near the Copper mines, *Wright*; near El Paso, *Parry*; and on the upper Pecos, east of Santa Fé, *Bigelow.*—Stems 1½–3 inches in diameter, hemispherical above, flattened or depressed in the centre, and top-shaped below; simple, as all the *Mamillariæ* of that form usually are. Tubercles 5–6 lines long; spines 4–6 lines in length, shorter in the southwestern, longer in the northeastern specimens; uppermost radial spine stouter than the others, with a brown tip, or smaller and slender, or entirely wanting; central spines usually 2 side by side, diverging laterally, or rarely one above the other; sometimes only one, or not seldom 3, the third one being below the two others; the hooks usually turned downward, or in different directions. The flowers seem to be lateral but very near the vertex, the fruit is moved more outward by the continuous growth of the plant. Flower about an inch long and fully as wide; petals and margin of inner sepals bright purple. Berry large, nearly an inch long, purplish; seed similar to that of *M. Grahami*, but much larger; and the very small and narrow hilum ventral; length of seed 0.7 line.—This species I with pleasure dedicate to my friend, *Mr. Charles Wright*, to whose indefatigable exertions botany owes so many new discoveries along the Mexican boundary line, and lately in more distant parts of the globe.

7. M. GOODRICHII, Scheer: globosa seu ovata, subsimplex; vertice tomentoso; tuberculis ovatis abbreviatis; axillis junioribus lanatis setigeris demum nudatis; aculeis radialibus 11–15 (plerumque 12–13) albidis apice sphacelatis intertextis, centralibus 3–4 (in plantis junioribus subsingulis) fusco-atris, superioribus divergentibus rectis seu rarissime subuncinatis, inferiore paullo longiore robustiore sursum hamato; floribus in vertice lateralibus parvis; petalis lanceolatis acuminatis sordide flavidulis medio rubellis; stigmatibus 3 virescentibus. (Tab. VIII., fig. 9–14.)

Dry ravines near San Diego, California, *Dr. Parry;* originally brought to England from the Island of Cerro on the Californian coast.—One of the specimens of Dr. Parry, from which the above description was drawn, is 2 inches high, and 1½ inch in diameter, the other is globose and rather depressed; the tubercles are 1½–2½ lines long and of a somewhat corky texture, like those of *M. Grahami*, so that the dead ones retain their shape and do not shrivel up. The axils produce a very dense wool, and in it 5–8 stiff bristles which often reach the length of the tubercle. The radial spines are 2½–3½ lines long, the uppermost one present or wanting. The upper central spines, 2 or 3 in number, are straight, or rarely in my specimens with a tendency to form a hook; the lower central spine is the longest one, 4½–5 lines long, the narrow, or rarely wide hook is turned upward or sidewise. Flowers 6–9 lines long, 6 lines wide, dirty yellowish, the petals with red midribs.

8. M. HEYDERI, Muhlenpf., of which my *M. applanata,* (Plate 9, fig. 4–14,) and *M. hemisphærica,* (Plate 9, fig. 15–17,) published in *Plantæ Lindheimerianæ*, are different forms, is common throughout the southern parts of New Mexico, and may even extend into Sonora, according to Mr. Schott's notes, unless what he has seen is a form of M. *gummifera,* (Tab. IX, fig. 18–20,) brought by Dr. Wislizenus from the mountains west of Chihuahua. The Sonora plant is stated to have 13 radial spines, the inferior ones are 6–8 lines and the superior ones 2–3 lines long, the stout central spine is of the length of the latter.

9. M. MEIACANTHA (sp. nov.): simplex, hemisphærica seu vertice depressa, basi obconica, lactiflua; tuberculis pyramidato-quadrangulatis compressis basi productis axilla nudis; areolis junioribus albido-villosis mox nudatis; aculeis paucis (5–9) rigidis rectis vel recurvatis albidis seu flavidis (demum cinereis) apice sphacelatis, inferioribus paullo longioribus, centrali singulo robusto breviore porrecto seu sursum flexo et cum cæteris radiante seu rarius nullo; floribus sordide albidis rubellisque; ovario nudo; sepalis 12–14 lanceolatis; petalis 14–16 lineari-lanceolatis acutis subintegris; stigmatibus 6–7 stamina brevia vix excedentibus flavidulis; bacca elongato-clavata incurva floris rudimenta dejiciente; seminibus minutis obovatis rugulosis fulvis. (Tab. IX., fig. 1–3.)

Throughout New Mexico, from where it was first brought home by the Missouri Volunteers in 1847; often collected since by the different explorers of the botany of those regions: fl. May and June.—Very nearly allied to the foregoing species; distinguished by the fewer more loosely arranged tubercles, which rise from a much broader base, and by the fewer, shorter and stouter spines. Plants 3–5 inches in diameter, with a broad top-shaped base, terminating in the large fleshy root; tubercles 7–9 lines long, strongly quadrangular, somewhat compressed from above, arranged in 13 spiral rows. Spines, as indicated by the name, fewer than in the allied species, 5–9, usually about 6, lowest one mostly a little longer than the lateral ones, 3–5 lines long, stout, and strongly subulate, often curved in different directions; upper spine wanting or often replaced by the stouter and a little shorter central spine, which is then turned upwards. Spines in robust specimens dirty yellowish with brown points; central one darker than the rest; in young and weakly specimens they are whitish. Flowers 12–14 lines long, somewhat urceolate; exterior petals longest, entire; interior ones a little shorter, entire or slightly denticulate; all whitish with a broad rose-colored line in the centre. The ovary does not exude the milky fluid, which the tubercles and other parts of the plant contain. Fruit ripening the second spring and summer, till then hidden between the bases of the surrounding tubercles, and for the greater part buried in the tissue of the plant; in spring the young fruit suddenly (in one or two weeks) grows to its full size, 9–12 or even 15 lines long, protruding far above the tubercles and forming an interior scarlet circle around the inner circle of rose-colored flowers. Seeds 0.5 line long subglobose-obovate, with a narrow sub-basilar hilum, yellowish brown, rugose and somewhat pitted.

10. M. SPHÆRICA, (Dietrich): e radice crassa obovata seu clavata, prolifera et demum densissime cæspitosa; tuberculis ovato-elongatis versus apicem acutatum conicis, axilla lanatis; areolis junioribus breviter tomentellis; aculeis setaceis basi bulbosis rectis seu curvatis albidis, radialibus 12—14, centrali singulo recto subulato subbreviore vix robustiore; flore subverticali magno flavo; tubo supra ovarium emersum constricto elongato; petalis sub-18 acuminatis aristatis integris; stigmatibus 8 linearibus patulis.

Hillsides on the Rio Grande near Eagle Pass, *Schott*: fl. from March throughout the season.—Dr. Poselger's specimens were collected at Corpus Christi, on the coast of Texas. Dietrich's description, taken from them, well agrees with Mr. Schott's plants and with specimens now frequently cultivated at St. Louis, from both of which the above character is drawn.—This species is remarkable on account of its exsert ovary and large flower, by which characters it closely approaches to the next subgenus; but the flowers, though apparently nearly vertical, come from last year's growth. Specimens before me are 2 inches high, 1¾ inch in diameter above, narrowed below, the old tubercles withering and leaving a short clavate scaly stem. The tubercles soon become proliferous, and the branches increase and reproduce often in such a manner as to form large and dense hemispherical masses. Tubercles 6–8 lines long; spines 3½–4½ lines long; flowers 1½–2 inches in length, and fully as widely open in bright sunshine; tube slender, funnel-shaped, remarkably constricted above the oval ovary. Fruit not seen.

Subgen. 2. CORYPHANTHA.

Plantæ simplices seu caespitosæ, tuberculatæ, aculeigeræ.

Tubercula plus minus teretia, florifera facie superiore longitudinaliter sulcata, in stirpibus junioribus nondum floribundis sulco breviori notata, vel penitus esulcata.

Areolæ floriferæ axillares seu in tuberculo ipso supra-axillares, cum areolis aculeiferis sulco villoso plus minus profundo demum nudato subinde glandulifero junctæ, tomentosæ.

Flores ex areolis tuberculorum hornotinorum adultorum (inde laxi) seu vix evolutorum (inde congesti) oriundi, plerumque magni, speciosi.

Ovarium emersum: bacca plerumque anno primo, rarissime anno secundo, maturescens, ovata seu subglobosa, viridis seu raro coccinea, sæpissime floris rudimentis coronata.

Semina plerumque majuscula, fulva, fusca seu nigra, lævia seu scrobiculata, nunquam tuberculata.

This subgenus, characterized mainly by the vertical position of the flowers, principally comprises species from the northern border of the Cactus region, most of them, until lately, unknown, or imperfectly known, to botanists. All the *Mamillariæ* of the Upper Missouri, and most of those from Texas and New Mexico, with which I had become acquainted, have grooved tubercles and showy vertical flowers, which fact I indicated as early as 1845, in the Plantæ Lindheimerianæ, and again in 1848, in Wislizenus' Report. Dr. Poselger, who, in his travels in Texas and Mexico, had the best opportunity of studying these plants, further verified this fact, and first noted that all the top-flowering *Mamillariæ* had grooved tubercles, at least in the fully developed parts of the plant; and he justly inferred that all *Mamillariæ* with grooved tubercles (the section *Aulacothecæ*) belong here. But he went further, and removed them from *Mamillaria* to *Echinocactus*, solely on account of the vertical flowers. Now some *Mamillariæ* of this section (e. g. *M. robustispina*) do approach *Echinocactus* in the shape of their embryo, as do others (e. g. *M. macromeris*) by having an occasional sepaloid scale on the ovary; while some *Echinocacti* (e. g. *E. setispinus*, *E. horizonthalonius*) have a straight embryo with very short connate cotyledons, and others have few and somewhat fugacious sepaloid scales on the ovary, (e. g. *E. intertextus*, *E. setispinus.*) Still I think that a safe line of distinction can be drawn between them, and that *Coryphantha*, though forming a transition to *Echinocactus*, much rather belongs to *Mamillaria*. But it must be admitted that the characters distinguishing most genera of Cactaceæ are almost as difficult to define as those of the species.

11. M. NUTTALLII, β CÆSPITOSA (M. similis, *E. in Plant. Lindh.* 1845) has been collected by Mr. Wright and others in the same part of Texas where Mr. Lindheimer had originally found it, viz: from the Brazos to Austin and San Antonio; it has since also been brought from the Kansas river, but does not seem to extend into the mountains of Western Texas. (Tab. LXXIV, fig. 6–7.)

12. M. SCHEERII, Muhlenpf. β? VALIDA: magna, robusta, ovato-globosa, simplex seu ad basin parce prolifera, glaucescens; tuberculis magnis remotis patulis e basi lata subcylindricis, supra sulco profundo glandula singula paucisve munito (juniore lanato) subbilobis; axillis latis,

junioribus dense tomentoso-lanatis; areolis orbiculatis villosissimis demum nudatis; aculeis 10–20 rectis seu subinde curvatis robustis rigidis basi bulbosis albidis seu citrinis apice fuscatis, radialibus 9–16, (3–5 inferioribus lateralibusque æquilongis robustioribus compressis, 7–11 superioribus debilioribus teretioribus), centralibus 1–5 validis augulatis paulo longioribus pallidis citrinis seu rubicundis, singulo validissimo porrecto; floribus in vertice tomentosissimo laxis flavis; sepalis 16–22 lanceolatis, inferioribus ciliatis; petalis 16–20 oblongo-lanceolatis versus apicem denticulatis mucranatis; stigmatibus 6–10; bacca viridi.

Sandy ridges in the valley of the Rio Grande, from El Paso to the Cañon; also at Eagle Spring, and on prairies at the head of the Limpia, *Charles Wright:* fl. in July.—A stately plant, by far the largest of the northern *Mamillariæ;* largest specimens before me, 7 inches high, 5 inches in diameter without the spines. Tubercles loosely arranged, in the smaller specimens in 8, in the larger ones in 13 spiral rows, at base ¾–1 inch in diameter, suddenly contracted and almost cylindric, 1-1½ inch long, and 5-7 lines in diameter, spreading, ascending; tubercles on the lower part of plant shorter, more conic, and somewhat imbricated. Groove very deep, with 1-5 orbicular depressed or hemispherical warts or glands, of nearly a line diameter. Central spines 10–18 lines long, mostly yellow; lower radial about 9–15, upper 5–10 lines long, when young mostly red at base, paler in the middle, and dark purplish-black at tip, sometimes yellowish; when old, all the spines become ashy-gray with dark tip. Flowers 2 inches long, yellow, ovary 5–6 lines long. Young and small specimens have smaller tubercles, and about 6–8 radial spines 6–9 lines long, with a single straight or recurved much stouter central one, an inch long.

M. Scheerii, from Chihuahua, is distinguished from our plant, according to Prince Salm's description, by the shorter and fewer (8–11) radial spines, and the single "much longer, one inch long," central spine; it is globose, 3–4 inches in diameter; flowers of same size as ours, with apparently entire (?) sepals, and red-streaked yellow petals. The areolæ are described as naked, while in our plant we find the young ones very thickly covered with long wool, which disappears by age. Nevertheless, I consider ours only as a northern form of the Chihuahua species, with more numerous and stouter spines; which character very often distinguishes northern and southern varieties of one and the same species.

13. M. ROBUSTISPINA, A. Schott in litt.: robusta, simplex seu cæspitosa; tuberculis magnis patulis subteretibus sulcatis; areolis magnis orbiculatis, junioribus dense tomentosis; aculeis radialibus 12–15 robustis rigidis, inferioribus robustioribus obscurioribus rectis seu deorsum curvatis, superioribus rectis fasciculatis paullo tenuioribus; aculeo centrali singulo valido compresso deorsum recurvato, subinde altero superiore rectiore adjecto, aculeis omnibus corneis apice atratis subpollicaribus; floribus e basi tuberculorum juniorum villosissima campanulatis luteis; tubo supra ovarium ovatum constricto tenui, intus ad basin usque filamentoso; sepalis lanceolatis, inferioribus ciliolatis; petalis numerosis; stigmatibus 9–10 patulo-erectis; bacca viridi; seminibus magnis oblique obovatis circa hilum parvum lineare centrale curvatis fuscis; cotyledonibus distinctis foliaceis. (Tab. LXXIV, fig. 8.)

On grassy prairies on the south side of the Babuquibari mountains, in Sonora, *A. Schott:* fl July.—A large plant, cespitose, perhaps from the effects of prairie fires, as Mr. Schott suggests. Tubercles nearly an inch long, and about an inch distant from one another; areolæ 3½–4 lines in diameter; spines 9–15 lines long, lower ones stouter but a little shorter than the upper ones, dark on the upper and lighter colored on the lower surface; central spines 1 or sometimes

2, stouter, but not much longer, than the others; base of lower or principal central spine nearly one line wide. Flowers, 1½–2 inches long, well characterized by the slender tube, which is contracted above the ovary, and quite similar in that respect to the flower of *M. sphærica* (see above); petals "saffron yellow"; filaments from the base of the tube, leaving no naked space above the ovary, as is the case in most species. Seeds 1.5–1.6 line long, and fully a line in diameter, the largest of any *Mamillaria* examined by me; albumen more distinct than usual in this genus; embryo curved, with somewhat foliaceous accumbent cotyledons, resembling much more the embryo of some *Echinocactus* than that of any *Mamillaria* known to me. The plant is evidently nearly allied to the foregoing, and also somewhat to the last species, but is distinguished by the very stout spines, and especially the slender and constricted tube of the flower. In *M. Scheerii* the filaments leave the lowest part of the tube free.

14. M. RECURVISPINA (sp. nov.): simplex, globosa seu depresso-globosa; tuberculis ovatis obtusis profunde sulcatis confertis subimbricatis; areolis obliquis ovatis; aculeis radialibus 12–20 basi bulbosa compressis rigidis recurvis flexuosisve albidis seu corneis apice sæpe adustis intertextis; aculeo centrali singulo (interdum secundo superiore adjecto) robustiore longiore obscuriore decurvato seu raro rectiusculo; floribus in axillis villosissimis tuberculorum juniorum subverticalibus majusculis flavicantibus extus fuscatis; sepalis lanceolatis acutis integris; petalis erosis.

Eastern parts of *Pimeria Alta*, in Sonora, especially in the Sierra del Pajarito, *A. Schott:* fl. June to August.—Heads single, mostly depressed, "4–8 inches in diameter" (a living specimen before me has only 3 inches.) Tubercles in my specimen in 13 spiral rows, 5–6 lines long, ovate, somewhat compressed from above; areolæ very oblique, ovate, 2–2½ lines long, white woolly when young. Radial spines, in my living specimen, 14–16; in a dried one, as many as 20; according to Mr. Schott's notes, 12–14. One spine is distinctly superior, and one inferior; the others are closely arranged along both sides of the areola, 4–9 lines long, upper ones often a little longer than the lower ones. Central spine 6–10 lines long, dark, mostly strongly recurved, adpressed, so that the plant can easily be handled without hurting; much like *M. compacta* from the mountains west of Chihuahua, to which it bears a strong resemblance. It seems to be fully distinguished, however, by the arrangement of the flowers, which in ours originate from the base of full-grown tubercles, and are scattered over the top of the plant, being pushed out by younger tubercles, bearing new buds; while, in the Chihuahua species, they come from the axils of young, just growing, tubercles, and are crowded on the densely woolly top. Flowers about 1½ inch long, and of the same width; petals lemon-yellow, darker, and with a brownish tinge outside along the midrib.

15. M. PECTINATA, (sp. nov.): simplex, globosa; tuberculis e basi quadrangulata conicis, inferioribus abbreviatis, summis floriferis teretibus longioribus sulcatis; areolis orbiculato-oblongis; aculeis 16–24 omnibus radiantibus plerumque subæqualibus seu summis fasciculatis longioribus, e basi bulbosa lateraliter compressa subrecurvis, pectinatis luteo-albidis demum cinereis apice sæpe sphacelatis intertextis; floribus e vertice tomentosissimo centralibus flavis; ovario globoso; tubo brevi amplo; sepalis sub-30 acutis aristatis, exterioribus lanceolatis apice recurvis, interioribus oblanceolatis adpressis; petalis sub-30 pluriserialibus oblanceolatis seu intimis obtusis retusisve, omnibus herbaceo-aristatis; stigmatibus 9–10 linearibus luteo-albis stamina longe superantibus; bacca ovata viridi floris rudimentis coronata; seminibus elongato-obovatis compressis lævibus lucidis fuscis, hilo parvo ventrali. (Tab. XI.)

On gentle slopes of the limestone hills on the Pecos, and at Leon spring, abundant at the latter place, (*Charles Wright*): fl. in June and July.—The globose heads are 1½–2½ inches in diameter; tubercles in 13 spiral rows, lower ones 2–3 lines long, and somewhat broader at base, not grooved, or with a very short groove near the spines; upper tubercles 5–6 lines long, and grooved all the way down. Spines on lower part of plant nearly equal in length on each tubercle, 3–4½ lines long, as stiff and pointed and almost as closely and regularly set as in *Cereus pectinatus*, whence the specific name. On the flower-bearing tubercles the upper spines are elongated, mixed with a few stouter ones, and fasciculated; lower ones 5–6 lines long, and upper ones, forming a tuft about the apex of the stem, 6–9 lines long. Flower over 2 inches long, and 2¾ inches in diameter when fully open, between 11 and 12 o'clock, closing already about 1 o'clock, though exposed to the full glare of the sun. Ovary 3–4 lines long; exterior sepals reddish-green, interior ones yellow, with a darker midrib; petals of a beautiful sulphur yellow, broadest in the upper third and obtusish. Filaments reddish, short, covering the whole base of the tube, leaving no naked space. Fruit about half an inch long, ripening on the vertex, and not pushed aside by succeeding young tubercles, as it seems that no new ones are developed till the fruit is fully ripe, or probably till the succeeding spring. This is the case with several allied yellow-flowering species, but not with other red-flowering ones, hereafter to be described; in these, though the flower (or at least the flower-bud) be vertical, the succeeding rapid growth pushes them aside , and still more the berries, which finally appear quite lateral. Seed 0.9 line long, elongated, compressed, rounded at the back, quite sharp at the anterior or ventral edge, on the lower part of which, in a slight curvature, the small and narrow hilum is situated.

16. M. Echinus (sp. nov.): simplex, globosa seu subconica; vertice dense tomentoso; tuberculis in planta adulta teretibus apice conicis supra sulcatis; areolis orbiculatis; aculeis rectis seu paullo curvatis cinereo-albidis apice sæpe obscurioribus, radialibus 16–30 pectinatis, superioribus longioribus fasciculatis, centralibus 3–4 validioribus e basi bulbosa subulatis, superioribus 2–3 sursum versis et cum radialibus superioribus implicatis, inferiore validissimo subulato recto (seu rarissime paullo recurvo) porrecto; floribus verticalibus flavis; sepalis 20 lineari-lanceolatis mucronatis integris, petalis 20–30 angustis; stigmatibus sub-12 stamina longe superantibus; bacca centrali oblonga viridi floris rudimentis coronata; seminibus ut in praecedente. (Tab. X.)

On limestone hills in the region of the Pecos, *Wright*, and from Presidio del Norte to Santa Rosa, *Bigelow*: fl. in June.—A very striking plant, characterized by the unusually stout and subulate lower central spine, which together with the globular shape, gives it the appearance of some Echinite, whence the name. Specimens before me 1½–2 inches in diameter, tubercles 5–6 lines long, in 13 spiral rows. The numerous slender but very stiff whitish radical spines, laterally compressed at the thickened base, are densely interwoven and closely adpressed; lower ones about 5 lines long, lateral ones somewhat shorter, upper ones 6–8 lines long; upper interior spines stouter and rather longer than the upper radial ones, but otherwise hardly distinguishable from them; the lower central spine is also about 6 or 8 lines long, very regularly subulate from a thick base. Flowers between 1 and 2 inches long, to judge from the shriveled specimens seen, yellow; fruit over half an inch in length; seeds about 0.9 line long, entirely similar to those of the last species, to which this, perhaps, too closely approaches. All the specimens from the Pecos have very straight central spines; but some from Presidio del Norte, not otherwise different, have somewhat recurved and darker horn-colored central spines.

17. M. SCOLYMOIDES, Scheidw.; a small slender-spined form was collected by *Mr. Wright* on the Pecos, and by *Dr. Bigelow* about Santa Rosa. Tubercles compressed, incurved, imbricated; radial spines on the upper ones about 20, with 4 longer and darker incurved central ones, the upper ones bent upwards and almost mixed with the upper radial ones; lower one mostly over an inch long. This species and the two preceding may possibly be forms of De Candolle's *M. cornifera.*

18. M. CALCARATA, E. in Pl. Lindh., has been collected by *Mr. Wright* as far west as the Nueces river. His specimens have only 8 or 10 radial spines, 4–6 lines long; central spine of the same length, but stouter, often (in young specimens?) entirely wanting. *Lindheimer's* original specimens from the neighborhood of the Colorado and Guadalupe rivers, have 10–12 radial spines 8–9 lines long; central spine stouter but shorter, sometimes wanting; seeds similar to that of *M. pectinata,* but larger and very obtuse at base; 1–1, 2 lines long. (Tab. LXXIV, fig. 1.)

19. M. TUBERCULOSA (sp. nov.): ovata seu ovato-cylindrica, simplex seu ad basin ramosa; tuberculis e basi rhomboidea ovatis abbreviatis obtusis, subcompressis, profunde usque ad axillam villosissimam sulco villoso exaratis confertis imbricatis, demum nudatis suberosis persistentibus; areolis orbiculatis, novellis albo-tomentosis; aculeis exterioribus 20–30 rigidis gracilibus albidis nunc apice sphacelatis radiantibus intertextis, interioribus 5–9 robustioribus sursum cæsio-purpureis apice sphacelatis, quorum superiores longiores erecti versus caulis apicem in comam aggregati, inferior brevior robustus porrectus deflexusve; floribus in vertice densissime tomentoso centralibus pollicaribus dilute roseis; sepalis 16–18 lanceolatis arachnoideo-fimbriatis; petalis 10–13 lineari-lanceolatis aristatis subintegris; bacca ovata elongata floris rudimentis breviter convolutis coronata rubra; seminibus subgloboso-obovatis scrobiculatis fuscis, hilo ovato minuto ventrali. (Tab. X., fig. 1—6.)

From the Pecos to Leon springs, Eagle spring, and El Paso, on the higher mountains, *Wright*; especially on the rocky summits of the "Flounce mountains," below El Paso, *Bigelow*: fl. in May and June.—A very pretty and well defined species of the mountain region. Stems 2–5 inches high, 1–2 inches in diameter, often with globose branches at the base; tubercles mostly only 3 lines long, and of the same width at base, often shorter, rarely and only in very vigorous plants 4 or even 5 lines long; in 13, or on the lower part of old plants in 21, spiral rows, like the whole body of the plant, of a corky texture and substance, almost dry, and therefore not shrivelling when old, but after shedding the spines, persistent and covering the older parts of the stem as grey, corky tuberosities, whence the name. The deep, densely woolly groove, and the very woolly axilla, which loses its coating only after several years, are quite peculiar to this species. Radial spines usually 22–26, rarely less than 20, and never in the numerous specimens examined by me more than 30, very slender but stiff, usually 2–4 lines long, lower and a few upper ones 2 lines, most upper ones 3–4 lines long, uppermost rarely 5 or even 6 lines in length; lower stout central spine 3–4, upper ones 5–7, and in a few specimens even 8 or 9 lines long; those of the uppermost tubercles crowded together, erect, forming a purplish grey tuft, which surrounds and partly hides flowers and fruit. Flowers very pale purple, about one inch in diameter; berry oval, elongated, and sometimes almost cylindric, red, and by both these characters distinguished from the fruit of the allied species; remains of flower not irregularly shrivelled up as in those species, but forming a regular, conic, whitish head on the red fruit. Seeds 0.4 or 0.6 line long, unusually thick, with a very small oval, not linear, hilum.

20. M. DASYACANTHA (sp. nov.): simplex, subglobosa; tuberculis teretibus leviter usque ad basin sulcatis laxis; axillis sulcoque subvillosis mox nudatis; areolis orbiculatis novellis, albo-tomentosis; aculeis gracilibus vix spinescentibus rectis patulis, exterioribus 25–35 capillaceis albidis apice sphacelatis, interioribus 7–13 setaceis longioribus infra pallidioribus sursum purpureo-fuscis apice atratis, centrali singulo æquilongo porrecto nunc deficiente; florum parvorum centralium sepalis arachnoideo-fimbriatis; baccis verticalibus ovatis parvis; seminibus obovato-globosis angulatis scrobiculatis nigricantibus; hilo lineari subventrali. (Tab. XII, fig. 17–18.)

El Paso and Eagle springs, *Wright.*—The few specimens before me are from 1½–2½ inches high, a little less in diameter; tubercles slender, 4–5 lines long, in 13 spiral rows; grooves slightly hairy when young; axils more or less villous, soon becoming naked. Spines not strictly radiating, but loosely spreading, much more slender than in the last and the next species, often even capillary; exterior ones 3–6 or even 9 lines long; interior spines forming a circle corresponding with the interior ones, but darker, stiffer, and longer, upper ones 8–12 lines, lower ones 6–9 lines long, or in some specimens shorter and slenderer; central spine single, erect, 6–10 lines long, often wanting. The dry and shrivelled fruit, found on the tomentose vertex, was only 3½ lines long; seeds thick, sometimes triangular, with a very broad back, 0.4–0.6 line long, almost black; hilum quite different in shape and position from that of the next species, to which this is closely allied. The plant so much resembles *Echinocactus intertextus* var. *dasyacanthus* that, at first sight, it might be taken for it.

21. M. VIVIPARA, Haw. (Cactus viviparus *Nutt. Gen.*) This species is found only on the northwestern plains, along the Upper Missouri and Yellowstone rivers, and up into the Black Hills and Rocky Mountains. It is a low plant, either simple or usually profusely proliferous and cespitose, shoots always from the base of the groove on the tubercle, or the axil proper, while in *M. calcarata* they come from the upper part of the groove, just below the spines. Radial spines 12–20, stiff, white, often brown-red at the top, 3–4 lines long; central spines 4, (3 pointing upwards, and the stoutest and shortest downwards,) but sometimes less, and often more, as many even as 8, usually 4–6 lines long; flowers central, large for the size of the plant, about 1½ inch long, and even more in diameter when fully open, (which is after one o'clock, later than in most other Cactaceæ,) with thirty or more delicately fimbriate recurved sepals and 25–40 narrow acuminate purple petals, which are naked or fimbriate at base; filaments whitish or purplish, almost from the base of the tube; anthers orange; style long-exserted with 5–10 linear pale or purple stigmata, which are pointed with a short mucro. Berries becoming lateral, being pushed aside by the continuous growth from the apex of the plant, oval, ½–¾ inch long, pale green, juicy, and slightly acid, full of yellowish-brown seeds. These are 0.7–0.8 line long, obliquely obovate, somewhat concave on the compressed ventral portion about the small oblong-linear hilum, pitted; albumen more distinct than in most other *Mamillariæ;* embryo straight, linear-oblong, with very short connate cotyledons. (Tab. LXIV, fig. 3.)

The following form, from Texas, which formerly I thought I could distinguish from this northern species, seems to be connected to it by numerous intermediate forms, found in the geographically intermediate region of New Mexico:

Subspec. *β.* RADIOSA: ovata seu demum subcylindrica, simplex seu e basi ramosa; tuberculis teretibus laxis leviter sulcatis; aculeis radialibus numero maxime variis (12–40), superioribus

longioribus robustioribus, centralibus, 3–12, quorum superiores robustiores, radialibus longiores, inferior robustus porrectus brevior; floribus in vertice demum lateralibus; sepalis 30–40 lineari-lanceolatis arachnoideo-fimbratis apice recurvis squarrosis; petalis totidem linearibus sensim acuminatis integris seu exterioribus basi fimbriatis; stigmatibus 5–10 obtusis purpureis tulis; bacca ovata floris rudimentis coronata viridi; seminibus obovatis scrobiculatis fulvis, hilo erecto parvo lineari ventrali.

Var. α. BOREALIS: ovata seu subglobosa, subsimplex; aculeis radialibus 12–20, centralibus 3–6 purpureo-maculatis; floribus minoribus; sepalis sub-25; petalis sub-30; seminibus minoribus ventre concavis. M. vivipara, var. *E. in Pl. Fendl. in Mem. Am. Acad.* (Tab. LXXIV, fig. 4.)

Var. β. NEO-MEXICANA: ovata seu ovato-cylindrica, sæpe e basi ramosa; aculeis radialibus albidis sub-30 (20–40), centralibus 6–9 (3–12) infra albidis sursum purpurascentibus apice atratis; floribus majoribus; seminibus majoribus ventre subconcavis.

Var. γ. TEXANA (M. radiosa, E. in Pl. Lindh.): ovato-cylindrica, subsimplex; aculeis radialibus 20–30 albidis apice adustis, centralibus 4–5 flavis seu fulvis; floribus majoribus; sepalis 40–50; petalis 30–40; stigmatibus 7–9; seminibus magnis ventre subconvexis. (Tab. LXXIV, fig. 5.)

Var. a has been collected in Northern New Mexico and about Santa Fé, by *Wislizenus* and *Fendler:* β, in the western parts of Texas and the southern parts of New Mexico by *Wright* and *Bigelow*; by the latter also on the upper Pecos, and in Sonora (a form with more spines than any other) by *Schott*. Var. γ was sent by *Lindheimer* from the Pierdenales, a tributary of the Guadalupe in western Texas: fl. in May and June.—Var. γ is the largest form, 2–5 inches high, with flowers 1½–2¼ inches in diameter when fully expanded, and seeds fully 1 line long. Var. β is an intermediate form, 1½ or 2 to 4 inches high, 1–2½ inches in diameter; tubercles 3–6 lines long; spines very variable in length and number; in smaller, younger specimens, the exterior spines are 2–4 lines, and the interior 3–6 lines long; in larger ones the former are often 3–8 lines, and the latter 5–10 lines long. Seed 0.7–0.9 line long, almost straight on the side of the hilum, or usually somewhat concave.—Var. a. approaches very near to *M. vivipara* of the north; the spines, however, are stouter; the flowers smaller; and the tubercles rarely proliferous; seeds as large as in the last, and of similar shape.

22. M. MACROMERIS, E. in Wisl. Rep.: simplex, seu ex sulcis tuberculorum inferiorum prolifera et demum cæspitosa, ovata seu cylindracea, læte viridis; tuberculis magnis e basi dilatata elongatis teretiusculis supra sulco (juniore villoso) ad medium ultrave usque ad areolam floriferam tomentosam supra-axillarem producto exaratis adscendentibus patulis laxis seu rarius plus minus imbricatis; aculeis gracilibus elongatis teretibus seu robustioribus sæpe angulatis compressisve rectis seu paullo curvatis, exterioribus sub-12 (10–17) patulis albidis seu junioribus subinde rubellis apice sphacelatis, inferioribus sæpe paullo brevioribus; aculeis centralibus 4 (in plantis junioribus sæpe 1–3 raro deficientibus,) longioribus robustoribus basi bulbosis plerumque nigricantibus, raro roseis fuscisve; floribus supra-axillaribus magnis e coccineo purpureis; ovario nudo seu squama una alterave sepaloidea munito; sepalis tubi 20–30 lanceolatis, inferioribus fimbriatis, superioribus integriusculis; petalis 20–25 oblongo-lanceolatis versus apicem denticulatis mucronatis; stigmatibus 7–8 supra stamina longe exsertis; bacca ovato-subglobosa nuda seu squamis paucis ciliatis instructa viridi; seminibus globoso-obovatis

lævibus fulvis, hilo oblongo-lineari ventricali; albumine parco; embryone recto; cotyledonibus minutis. (Tab. XIV–XV.)

In the valley of the Rio Grande, from Doña Ana, above El Paso, *Wislizenus*, to the cañon below that town, *Wright*, and to the mouth of the Pecos and to Eagle Pass, *Bigelow*, and lower down, mostly in loose sand, on hillocks confined by the roots of *Algarobia*: fl. July and August.—A splendid and very interesting species, 2–4 inches high; tubercles very different in size in different specimens, from 6 or 7 to 10 or 12, and sometimes even 15 lines long, generally arranged in 8 spirals. The groove is absent in the tubercles of the young plant; in the older ones it shows itself slightly, and only near the point of the tubercle, from the spine downwards; in more fully developed tubercles it becomes longer, till in the flower-bearing ones it reaches downward to the lower third, but never to the axilla; there it enlarges into the flower-bearing areola.—Radial spines 6–20 lines long, whitish or the upper ones or all rose-colored when young; central spines 1–2¼ inches long, the lowest one longer and stouter than the rest, mostly black, in some specimens paler, straight, or sometimes curved or twisted. Flower 2½–3 inches long, and of the same diameter, deep rose-color or carmine verging to purple, darker along the centre and towards the tip. Fruit 8 to 10 or 12 lines long; seeds different in size, 0.7–0.8 line long, short and thick, with a decidedly ventral hilum. Albumen distinct, more so than in most other *Mamillariæ*, but the embryo quite similar to them. The scales on the ovarium indicate an approach to *Echinocactus*, though the habit of the plant is decidedly that of a *Mamillaria*.—*M. dactylothele*, Lab. is a variety of this species.

Subgen 3. ANHALONIUM.

Plantæ simplices, tuberculatæ, subinermes.

Tubercula subfoliacea, triangularia, lævia seu supra verrucoso-fissurata.

Areolæ floriferæ supra-axillares (an semper?), jubato-villosissimæ.

Flores ex areolis tuberculorum hornotinorum nascentium oriundi, in vertice congesti, mediocres.

Ovarium emersum: bacca floris rudimentis coronata, plerumque anno primo maturescens.

Semina majuscula, nigra, tuberculata.

These very curious plants, some of them looking more like some *Aloë* than like a *Cactus*, can nevertheless not be separated from *Mamillaria*. The seed is the only part of the organs of fructification which seems to offer any character, by having a hard, roughly tuberculated testa in ours as well as in another Mexican species which I had the opportunity to examine. Our species (and probably all the others) has the flower and fruit sessile upon the lower part of the tubercle; and elevated above the axil, much as in *M. macromeris;* but, unlike that plant, the lower part of the tubercle is entirely distinct from the upper one.

23. M. FISSURATA (sp. nov.): e radice crassa napiformi simplex, depresso-globosa seu applanata; vertice densissime villoso; tuberculis e basi applanta dilatata crassis triangularibus inermibus extus infraque lævibus seu versus marginem crenulatum rugosis, supra sulco centrali villoso lateralibusque 2 nudis profunde quadripartitis et sulcis transversalibus in tubercula irregularia angulosa numerosa multifidis; floribus e villo longo sericeo centralibus breviter tubulosis; sepalis sub-20, inferioribus lineari-lanceolatis integris carnosis albidis, superioribus spathulatis cuspidatis; petalis sub–12 spathulatis versus apicem obtusum mucronatum integriusculis seu laceris roseis; stigmatibus 5–10 erecto-patulis; baccis ovatis pallide virescentibus in lana

densa occultis; seminibus obovato-globosis tuberculatis nigris opacis, hilo basilari transverso; embryone obovato erecto. (Plate XVI.)

On hard, gravelly, limestone hills, near Fairy Springs, not far from the mouth of the Pecos, and between that river and the San Pedro, *Schott, Bigelow;* and higher up on the rocks of the cañon of the Rio Grande, *Parry:* fl. September and October.—The lower part of the plant is top-shaped, covered with the scale-like remains of the earlier tubercles; the upper part is hemispherical or depressed and flattened, hardly elevated above the surface of the ground, 2–4½ inches in diameter; tubercles in my specimens 6–10 lines long and a little less broad, or sometimes the upper warty part "¾ inch long and 1¼ inch wide," in 5 or 8, or rarely in 13 spiral rows. Lower part of tubercles flattened, acute at the edges, slightly carinate, more on he upper and less on the lower surface, smooth. Upper and exposed part of tubercle triangular in outline, convex, carinate and almost smooth below, convex and variously fissured and thereby verrucose above, sharp and crenate on the edges. The principal groove on the upper surface is a longitudinal one corresponding to the groove of the different species of *Coryphantha*, and like that villose; towards its base (at the base of the upper or warty part of the tubercle) it expands into the floriferous areola, upwards it ceases just under the acutish point of the tubercle without any trace of an aculeiferous areola or of spines; in the young tubercle it is coated by dense, long and straight, white or yellowish, silky wool, (about an inch long,) which from being exposed to the weather gets matted and dirty, and after several years entirely disappears. Two lateral grooves run parallel with this, and together with the many transverse fissures cut up the upper surface into numerous angular tubercles or warts. Flowers central or vertical, in the sense of the term as explained before, borne on the lower smooth part of a very young tubercle, which when bearing flower and fruit is somewhat thickened, and takes the shape and functions of a short penduncle, bearing laterally the upper part of the tubercle like a small bract. The axils even of these young tubercles are entirely naked; the long wool which covers the lower part of the flower, and entirely hides the whole fruit, being produced entirely from the areola and the central groove. Flower about an inch long and of the same diameter when fully open; ovary 3 lines long, oval; tube 4–6 lines long; 12 exterior sepals, whitish, fleshy, 8 inner ones spathulate, mucronate, with rose-colored edges 6–9 lines long, 2 lines wide; petals about 12 in a single series, 9 lines long, 2 lines wide, rose or pink-colored; stamens numerous, white with orange anthers; style white, expanding into a funnel-shaped irregularly 5–10 parted light-yellow stigma. Fruit oval, crowned with the remains of the flower, about 5 lines long, juicy. Seed 0.8 line long, strongly tuberculated, the transverse and somewhat truncate hilum basilar.

II. ECHINOCAC ,—Link and Otto.

1. E. Scheerii, Salm: e radice tereti elongata parvus, globosus seu ovatus; costis 13 obtusis interruptis; tuberculis ovatis obtusis supra ad medium sulcatis; areolis ovato-orbiculatis junioribus albo-tomentosis; aculeis radialibus 15–18 setaceis rigidis rectis seu plerumque paullo recurvatis albidis stramineisve apice fuscatis, summo interdum elongato, centralibus 3–4 angulatis variegatis fusco-atris, superioribus rectis sursum divaricatis longioribus, inferiore porrecto hamato breviore; floribus in vertice laxis; sepalis exterioribus 13 squamiformibus, inferioribus appendiculato-auriculatis margine membranaceo laceris ciliatis, superioribus ovatis integriusculis, sepalis interioribus 8 lineari-oblongis obtusis; petalis 13 lineari-lanceolatis acutis flavo-virescentibus; stigmatibus 8 linearibus flavis; bacca virescente indistincte squa-

mata; seminibus oblique obovatis compressis minutissime tuberculatis fuscis, hilo ventrali circulari magno. (Tab. XVII.)

About Eagle Pass, on the Rio Grande, *Schott*, *Bigelow:* fl. in April.—A most elegant little species, 1½–2 inches in diameter and of the same height. Root long, terete, rather fleshy, white, about ½ inch in diameter, such as I have not seen in any other of our *Cactaceæ*. Tubercles more distinct and less plainly arranged in ribs than in the other species of this genus; they are 4 or 5 lines high, somewhat compressed, of the same transverse diameter, and a little longer in the other direction; areola about 1½ line long, a little less broad, extending upwards into a tomentose groove, 1–2½ lines long, which terminates in the floriferous areola half-way down to the axil, as the transverse incision in the rib may be designated. This groove is much shorter or almost wanting on the tubercles, which bear no flowers. The exterior spines, with their bulbous compressed bases, are closely and regularly arranged all around the areola, and are strictly radiating; in younger plants I find 11–13, in older flower-bearing tubercles always 15–18 radial spines, 3–5 lines long, of almost equal length, or the lateral ones a little longer than the rest; the uppermost radial spine, however, is often somewhat stouter and longer, ranging rather as an upper central spine, when only 3 of these are present. The upper central spines (2 in my specimens from Eagle Pass, 3 in Salm's original plant) are stouter, somewhat compressed and angled, brown or black on the upper and whitish or mottled on the lower surface, or they are lighter throughout, with black tips; they are 8–12 lines long; the lower central spine is 2 or 3 lines shorter, black on the upper side, especially at base, and at the hooked point white on the lower surface and again on the outside of the curvature. The green flowers are about an inch long, much less in diameter even when fully open. Fruit and seed not seen by our collectors; the former is said by Dr. Poselger (who has sent me a good specimen of the plant, entirely agreeing with my specimens) to be a small green and almost naked berry; his seeds are large, about one line long, 0.8 line in diameter, with very minute and flattened tubercles, *brown* (the only *Echinocactus* with seeds of that color known to me); hilum large and circular, surrounded by a thick rim; albumen very small; embryo curved, but cotyledons small, connate, more like those of a *Mamillaria*, separating on the curvature and not at the end of the hook, as in all other hooked embryos of *Cactaceæ* known to me.

2. E. BREVIHAMATUS (sp. nov.): e radice turbinata fibrosa globoso-obovatus, atro-viridis; costis 13 compressis tuberculato-interruptis; sulcis acutis profunde incisis; tuberculis supra ad basin usque tomentoso-sulcatis; areolis orbiculatis junioribus breviter albo-tomentosis; aculeis radialibus 12 teretibus rectis albidis seu sordide flavis apice adustis, superioribus longioribus; centralibus 4 complanatis albidis apice atratis, lateralibus sursum divergentibus rectis seu paullo recurvatis aculeos radiales superantibus, summo debiliore et infimo porrecto seu deflexo deorsum hamato robustiore eos subæquantibus; floribus infundibuliformibus roseis; sepalis inferioribus (ovarii) 5–7 reniformibus scariosis ciliatis, superioribus (tubi) 8 ovato-oblongis mucronatis obtusisve; petalis 13–14 lineari-lanceolatis acutis mucronatis integris; stigmatibus 10–11 radiatis flavis stamina rubella paullo excedentibus. (Tab. XVIII, XIX.)

On the San Pedro, *Wright*, and not rare about Eagle Pass, *Bigelow:* fl. March and April.—The specimens sent by the gentlemen of the Boundary Commission were from 2 to 4 inches high, and 2–3 in diameter, of a very dark green color, and remarkable from the tuft formed on the apex by the upper central spines, in which the numerous flowers are almost entirely hidden; the lower hooked central spines stand out from the mass of the other spines, the hooks turned downward. All the specimens grew well at first, one flowered abundantly, but all soon died from an internal rot, just as all the specimens of *E. uncinatus* did, though they were treated like the other *Cactaceæ* from the same region, which are doing well. Areolæ 2 lines in diameter, 8–12 lines distant, connected with the floriferous areolæ in the axils of the tubercles by a tomentose groove of 4 or 5 lines length. Radial spines almost always 12, very rarely 1 or 2 more, 5–10 lines long, upper ones longer than the lower, and light colored, lateral ones darker when young, but difference of shade soon lost; upper central spine 8–10 lines long, lateral ones usually 14–22 lines in length, always exceeding the upper and lower one; this last one is the stoutest and broadest of all, 9–14 lines long, mostly yellowish-brown, darker on the upper, lighter on the lower surface, and with the hook brown or black; rarely 1 or 2 additional central spines are noticed. Flower 12–16 lines long, only 9 or 10 lines wide when fully open at noon; petals 7–8 lines long, 2 lines wide, pale rose colored, with a deeper colored midrib. Fruit and seed unknown.—Near the last species, distinguished by the larger size, the very different root, the smaller number of radial spines, the shortness of the upper central spine, and the red color of the flowers; other differences will no doubt be found in fruit and seed. Name from the shortness of the hook, by which the species is distinguished from most other allied forms.

3. E. UNCINATUS, Hœpf., var? WRIGHTII: glaucescens, ovatus; costis 13 compressis tuberculatis supra usque ad basin sulcatis; areolis ovato-orbiculatis, junioribus albo-lanatis; aculeis radialibus 8, inferioribus 3 brevioribus teretibus uncinatis purpureo-fuscis, cæteris 5 compressis rectis infra stramineis sursum rubellis apice fuscis, summis longioribus latioribusque, centrali singulo complanato basi angulato flexuoso elongato hamato erecto stramineo apice fusco; floribus ex areola penitus axillari ortis; sepalis inferioribus 25–30 imbricatis squamæformibus e basi longe auriculata triangularibus hyalinis, superioribus 15–25 ovato-orbiculatis cordatis acutis purpurascentibus, superioribus 18–20 lineari-oblongis obtusis purpureo-fuscis, sepalis omnibus margine membranaceo albido ciliatis; petalis 20–30 lineari-lanceolatis obtusiusculis purpureis, internis mucronatis denticulatis; stylo supra stamina numerosissima exserto stigmatibus 10 carneis suberectis; bacca ovata rubella; seminibus curvatis oblique obovatis tuberculatis hilo circulari basilari. (Tab. LXXIV, fig. 10.)

Near El Paso, and on the river below, also at Eagle springs, on stony hills and nearly to the top of the mountains, commonly in tufts of grass or hidden among low bushes, *Wright*, *Bigelow:* fl. in March and April.—Oval, 3–6 inches high, 2–3½ inches in diameter, with a long tuft of the whitish hooked central spines, which are at first difficult to distinguish from the surrounding bunches of dead grass. The adult plants have generally 3, very rarely 4 lower hooked radial spines, ¾–1¼ inch long; 5 lateral and upper radial spines 1–1½ inch long, paler and flattened; the uppermost one longer, broader, and whiter than the rest; sometimes I find 6 upper spines, when the 3 outer and more slender ones appear radial, and the 3 inner and stouter ones assume the position of 3 upper central spines; there are then 6 radial and 4 central spines. The hooked central spine is 2–4 inches long, and not annulated. Young plants have 6–7 radial and 1 central spine, all terete and purplish, with darker tips, all ½–1 inch long; in older specimens, the central spine elongates, and finally becomes flattened and whitish. Groove on the tubercles 2–3 lines long, so that the *axillary* flower is distant thus far from the spines; flower 1–1½ inch long, dark purplish-red, opening at midday in bright sunshine; filaments at least 1000, yellow below, orange at tip. Fruit ovate 8–12 lines long, pulpy red, setting off the white membranaceous sepaloid scales. Seed 0.7–0.8 line long, remarkably curved and contracted at the base; compressed, (more so in the ventral curvature,) carinate on the back, tuberculate; the small circular hilum surrounded by a very tumid, smooth, and shining rim. Albumen large; embryo hooked, with foliaceous cotyledons.

The Mexican *E. uncinatus*, of which I have seen spines and seeds collected by *Dr. Poselger* between Saltillo and San Luis Potosi, and flowers found by *Dr. Gregg*, near Parras, has 7–8 radial spines, the 3 lower ones of which are hooked, and 4 central ones, the lowest one flattened and elongated; lower sepals 36, upper ones about 14, oblanceolate, aristate, margined; petals 25, linear-lanceolate, acuminate, aristate; 8–10 stigmata; seeds 0.6–0.7 line long, very much compressed, curved, almost cochleate, smoothish and shining; circular hilum almost ventral; albumen and embryo same as in the other. (Tab. LXXIV, fig. 9.)

4. E. SETISPINUS, E. in Pl. Lindh. Many forms have been collected by the Commission; all characterized by 13 narrowly-compressed ribs, slender flexible spines, small bright-red globose fruit, and globose-obovate oblique strongly tuberculated seeds, with an almost circular basilar hilum. The heads are globose, or usually lengthened and almost cylindrical when old, but sometimes depressed; spines short or long, the central spine usually somewhat longer than the others, but in some specimens from the Rio Grande shorter, in others from Eagle Pass much longer than the others, and erect, sometimes hardly curved. Seed usually 0.6 line long; in the above-mentioned specimen from Eagle Pass 0.8 line in length. The geographical range of this species is from the Brazos south to the Rio Grande, whence *Berlandier* has sent it under the name of *Cactus bicolor*, and west to near the San Pedro.

5. E. SINUATUS, Dietr. (E. setispinus, γ. sinuatus *Poselg.*): globosus, læte viridis; costis 13 obliquis compressis acutatis interruptis; tuberculis breviter sulcatis; areolis orbiculatis, junioribus albo, seu griseo-villosis; aculeis radialibus 8–12 setiformibus flexilibus, 3 inferioribus et 3 superioribus purpureo-fuscis rectiusculis, lateralibus 2–6 tenuioribus longioribus sæpe compressis rufis seu interdum flexuosis hamatisve albidis; aculeis centralibus 4 quorum 3 superiores graciles compressi seu sub-angulati erecti plerumque recti, infimus latior compressus seu canaliculatus flexuosus elongatus stramineus basi purpurascens apice subhamatus; floribus ab areola aculeifera paullo distantibus; sepalis inferioribus 20–30 cordato-auriculatis, superioribus 15–20 lanceolatis basi auriculatis margine membranaceis; petalis 20–25 lanceolatis sulphureis; stylo longe supra stamina exserto; stigmatibus 8–12 apiculatis erecto-patulis; bacca ovata squamis 7–10 munita viridi; seminibus obovatis seu lenticularibus hilo oblongo subbasilari excisis lucidis sub lente minutissime punctatis. (Tab. LXXIV, fig. 11–14.)

On the Pecos, San Pedro, and Rio Grande rivers, *Wright*, *Schott*.—I have above given a careful description of this plant, because it is so nearly allied to the foregoing and especially to the next species, which Dr. Poselger thinks it connects. With the former it has in common only the compressed ribs and the setaceous radial spines, but is distinguished by its size, the central spines, the fruit, and especially the seed. From the next species, to which it much more closely resembles, it is distinguished by the compressed ribs, the slender radial spines, the smaller number of all parts of the flower, the small fruit, and the smaller very finely punctate seed. My specimens are 4 or 5 inches in diameter, while Dr. Poselger's were 8 inches thick; areolæ 8–10 lines apart; 3 lower spines smooth purplish-brown, lighter at top, $\frac{3}{4}$–1 inch long, lateral spines puberulent, straw-colored, 1–$1\frac{1}{2}$ inch long; central spines puberulent, 3 upper ones yellowish, generally darker at base, $1\frac{1}{2}$–2 inches long; lower central spine much stouter and longer than all the others, and flattened or even channelled, pale-yellowish, often purplish at base, flexuous, more or less hooked, sometimes straight, 2–4 inches long. Flowers 2–3 inches long, yellow, apparently without the scarlet base of the petals, which I always find in both the allied species, externally greenish; fruit oval, 8–9 lines long, with 7–12 scales; green when ripe; seeds 0.4–0.6 line long. Dr. Poselger describes another form under the name of *E. setispinus δ. robustus*, which is said to have all four central, and often the three lower radial spines, also, more or less hooked. The seed which he has sent to me leaves no doubt in my mind that it is a form of *E. sinuatus*. In my specimens only the lateral spines sometimes are flexuous, or hooked, or almost curled.

6. E. LONGEHAMATUS, Galeotti: subglobosus seu demum ovatus, læte-viridis, costis 13–17 sæpe obliquis tuberculato-interruptis latioribus obtusis; tuberculis ovatis supra brevissime sulcatis; areolis ovatis seu suborbiculatis distantibus; aculeis junioribus demum totis cinereis; radialibus 8–12 rectis curvatis flexuosisve patulis, superioribus gracilioribus pallidioribus, infimo brevi, lateralibus longioribus subannulatis; aculeis centralibus 4 (1–4 superioribus adventitiis subinde adjectis) angulatis compressis annulatis, quorum superiores recti seu curvati seu contorti sursum versi, infimus robustior plerumque longissimus sæpe flexuosus plus minus uncinatus porrectus vel deflexus; floribus ab areola aculeifera vix sejunctis infundibuliformibus, limbo patulo; ovario ovato; sepalis scarioso-marginatis ciliatis, inferioribus 30–60 squamiformibus reniformibus, mediis 10–20 obovato-spathulatis, interioribus 15–20 demum oblongo-obovatis obtusis cuspidatis; petalis 20–30 oblanceolatis obtusis vel retusis denticulatis cuspidatis seu mucronatis sulphureis ima basi coccineis et sæpius dorso rubellis; stigmatibus 15–18 obtusis sulphureis patulis; bacca ovata squamosa viridi; seminibus globoso-obovatis hilo ovato subbasilari oblique excisis scrobiculatis lucidis. (Tab. XXI—XXIV.)

Var. *α*. CRASSISPINUS. E. flexispinus, *E. in Wisl. Rep.* non *Salm.*

Var. *β*. GRACILISPINUS: aculeis gracilioribus 16–20, exterioribus 12–14, centralibus 4–8, infimo elongato hamato. E. hamatocanthus, *Muehlenpf.*

Var. *γ*. BREVISPINUS: aculeis gracilioribus, radialibus 8–11, centralibus 4 teretibus cum infimo hamato radiales vix superantibus.

Along the middle course of the Rio Grande and near the Pecos and San Pedro rivers, on the mountains of the Limpia, and near Presidio del Norte, and southward into Mexico, but not as far west as El Paso, *Wright, Bigelow*: fl. June and July.—Heads ½ to 2 feet high, but flowering often when not more than two inches high. Ribs usually 13; areolæ roundish in younger, more elongated in older specimens, often only 6–10 lines, but in vigorous plants 1–1½ inch apart. Spines glabrous, or only the lower central one scabrous-pubescent; lateral spines whitish, all the others purplish or variegated, with paler semitransparent tips. The forms *β*. and *γ*. are those which occur in our territory; they differ in the length and number of spines, but not at all in flower and fruit. In Var. *β*. the lower and upper radial spines are 1–3 inches, the lateral ones 2–3½ inches long, upper central spines 2–5, and lower one 3–6½ inches long. Var. *γ*. is perhaps the young plant, as these plants often flower when yet quite young, and before the character of the mature plant is yet fully developed. This in a very marked degree is the case with *E. uncinatus*, var., which begins to bloom while the central spine is yet quite short and terete. Lower radial spines ½–1¼ inch, upper ones 1¼–2 inches long, lateral ones 1¼–1½ inch, and central spines all 1½–2 inches long. Flowers form a groove just above the spines, separated from the spiniferous areola by 2–5 obtuse cylindric glandular bodies which often exude a clear viscous liquid. I find them also in *E. setispinus*, *E. Emoryi*, and numerous others, and they correspond, no doubt, with the glands in the groove of *Mamillaria Scheerii* and others. They appear with the flower, and are soft and fleshy at that time; afterwards they become hardened, of the texture of the spines themselves, and are persistent. Flowers 2½–3½ inches long, externally greenish-yellow and red, internally yellow, with a red base. Fruit 1–2 inches long, coated with 25 or 40 or more scales, crowded with the remains of the flower, green and very acid, (*Bigelow*,) or insipid or sweetish when fully ripe (*Parry;*) seed larger than in the last species 0.7–0.8 line in the longest diameter, deeply and distinctly pitted under the lens.

7. E. WISLIZENI, E. in Wisl. Rep. has been often collected by the different gentlemen attached to the commission between Doña Ana and El Paso, and probably on the upper Gila, but not eastward. Small specimens show only 13 ribs; full-grown ones usually have 21 or even as many as 24 ribs; areolæ from ½ to 1½ inch distant from one another; on older plants closer than on half-grown ones; 3 lower radial spines annulated; stout, 8–20 lines long; 3 upper ones somewhat slenderer, but also annulated, 1½–2 inches long; in younger specimens these latter are wanting; in old ones they move more towards the centre of the areola, and become surrounded by the upper bristly spines. Lateral bristle-spines 15–20, 1½–2¼ inches long, often twisted, spreading horizontally. All the stouter and annulated spines are red with paler semitransparent points; the weaker spines are yellowish-white. Ovary and fruit imbricately covered with 60 or 80 scales; fruit rather fleshy but not juicy, and soon hardening; seed oblique obovate 1.0–1.2 lines long; hilum small, broadly oval, subbasilar, or sometimes almost ventral; surface of the seed finely reticulated under the lens; curved foliaceous cotyledons partly buried in the large albumen. (Tab. XXV—XXVI.)

8. E. LE CONTEI, E. in Pacif. R. Report: This fine species, which was discovered by *Dr. Le Conte* on the lower Gila, and found again by *Dr. Bigelow* higher up on the Colorado, has been observed frequently by *Mr. Schott* in the western part of Sonora, where it flowers in August and September. The flowers, which had not been seen by any other observer, may be described thus:

Floribus plurimis subcentralibus; ovario squamis 30–50 sepaloideis reniformibus munito, sepalis tubi inferioribus 20–30 ovato-lanceolatis acutis ciliatis, superioribus 10–20 margine petaloideis obtusiusculis cuspidatis; petalis 20–30 lineari-spathulatis obtusis inciso-fimbriatis mucronatis sulphureis; tubo basi intus nudo; stylo stamina superante ad medium in stigmata sub-14 linearia fasciculata diviso. (Tab. XXVII.)

Mr. Schott's specimens were 3–4 feet high, clavate and usually only one-third as thick. Dr. Bigelow's specimens were not as slender. Flowers two inches in length, "somewhat campanulate, "petals "lemon-yellow," with a brownish tint along the midrib; tube naked for about one line above the base of the style.

9. E. EMORYI, E. in Emory's Rep., 1848: grandis, ovatus, glaucescens; costis 13–21 rectis obliquisve obtusis tuberculatis; areolis ovatis junioribus dense sordideque tomentosis; aculeis 8–9 subæqualibus robustis subangulatis annulatis paulo recurvis rubellis demum fuscis apice sub pellucido corneis, radialibus 7 seu interdum adjecto (aculeo tenuiore summo) 8, lateralibus sublongioribus, centrali singulo recurvo seu subhamato paullo robustiore; floribus magnis purpureo-variegatis; sepalis ovarii 25 reniformibus ciliolatis, superioribus spathulatis lanceolatis

acutis; petalis sub-25 lanceolatis acuminatis versus apicem fimbriato-fissis; stylo stamina vix superante profunde 18–20-partito. (Tab. XXVIII.)

On the Gila, *Emory;* the lower Colorado, *Bigelow*; and in Sonora, at Punta de Agua, Sierra del Pajarito, Sierra de la Union and Sierra de Sonoyta, *Schott*: fl. in August and September.—Largest plants 30–36 inches high and 18–24 inches in diameter, with 20 or more ribs, smaller ones a foot in diameter, and globose, only 13-ribbed. Ribs strongly tuberculated, tubercles quite distinct, especially on the younger plants, and rounded, on old plants more confluent; areolæ 6–10 lines long, 1½–2 inches apart, oval, separated from the contiguous but smaller floral areola by 2–5 terete obtuse finally ligneous glands. Radial spines mostly 1–2 inches long, in a very large specimen from Guaymas, on the Gulf of California, procured by Dr. Bigelow, and now in the Congressional Garden in Washington, nearly 3 inches long; the 4 upper lateral spines are the longest and stoutest; the lower ones, and, if present, the uppermost radial spine, (in the specimen from Guaymas sometimes two), are shorter and slenderer than the others. Flowers aggregated near the vertex, about 3 inches long, dark brown purple outside; petals red, with yellowish margins; filaments rising from the thick and fleshy upper part of the short tube, leaving its lower part naked, extremely numerous; style thick, as long as the longer (exterior) stamina, divided to the middle into 18 or 20 filiform stigmata. Fruit and seed as yet unknown.

10. E. VIRIDESCENS, Nutt.: globosus seu depressus, simplex seu e basi ramosus; vertice depresso tomentoso; costis 13–21 compressis vix tuberculatis; areolis orbiculato-ovatis junioribus tomentosis; aculeis compressis annulatis plus minus curvatis e virescente rubellis, radialibus 9–13 (18–20, ex (*Parry*) infimo robusto breviore deorsum curvato, centralibus 4 robustioribus 4-angulatis compressis cruciatis, inferiore latiore longiore mimus curvato; floribus subverticalibus e flavo virescentibus; ovario globoso squamis sepaloideis 25–40 semilunatis reniformibusve denticulatis imbricatis stipato; sepalis tubi 25–30 ovatis oblongisve obtusis; petalis 20 oblongis obtusis eroso-denticulatis; stylo usque ad medium in stigmata 12–15 linearia erecta albida diviso; bacca ovata seu subglobosa squamata virescente floris rudimentis coronata; seminibus oblique obovatis dorso carinatis minutissime scrobiculatis, hilo orbiculato parvo subventrali. (Tab. XXIX.)

San Diego, California, on dry hills and ridges *Nuttall*, *Parry;* on the sea-beach, *Schott*. According to Nuttall this species is about 1 foot high, and has 9 or 10 inches diameter. Dr. Parry found them usually flat, 4 or 5 inches high (above ground) and 6–7 inches in diameter. They are usually simple, but sometimes, "only when wounded or burned over by fires," they branch from the base, forming in favorable situations quite a pile of prickly balls. In a young specimen brought home by Dr. Parry, about 2 inches in diameter, with 8 ribs, I find only 9 radial slightly recurved spines; the lowest and most curved one 4–6 lines long; the 2 upper ones 6–8 lines, and the 6 lateral ones 8–9 lines long; the 4 central spines are much stouter, more distinctly angular, compressed, and annulated, 10–16 lines long, the uppermost one more curved, the lowest one almost straight. Schott, in his notes made on the spot, states the number of radial spines to be 13, much shorter than the central spines; Parry describes the radial spines of the adult plant as 18–20, not more than 6–9 lines long, while the longest central spine is about 18 lines long. Flowers disposed in a circle around the vertex, greenish, 1½. inch long, 1¼ in diameter; tube inside naked at base; stamina short; style about one inch long, more deeply divided than in other species. Fruit 8–10 lines long, of the shape and taste of a gooseberry;

bluish-green in Parry's specimens, with 25–30, in Schott's with 35–40 scales; seed 0.8 lines long, very minutely but distinctly pitted.

11. E. CYLINDRACEUS, E. in Sillim. Journ., 1852, sub *E. viridescente:* ovatus seu ovato-cylindricus, simplex seu plerumque e basi ramosus; vertice breviter tomentello; costis 21 seu pluribus rectis seu obliquis obtuse tuberculatis; areolis ovatis; aculeis robustis compressis annulatis plus minus curvatis flexuosisve rubellis apice corneis, radialibus 12 sæpe cum aculeis gracilioribus sub–5 summæ areolæ insertis, lateralibus tenuioribus, infimo robusto breviori decurvato-hamato; aculeis centralibus 4 robustissimis 4–angulatis compressis cruciatis, superiore latiore sursum suberecto, inferiore deorsum curvato; flore flavo; bacca subglobosa carnosa pallide virescente sepalis semilunatis fimbriatis stipata, floris rudimentis coronata. (Tab. XXX.)

Rocky ravines near San Felipe, on the eastern slope of the California nmountains, in latitude 33°, *Dr. Parry;* also seen by *Dr. Le Conte.* Young plants globose, older ones ovate and cylindric; the former have 13 ribs, the latter from 20 to 27; the largest specimens seen were 3 feet high and a foot in diameter. They often branch out at base, which by Dr. Parry is ascribed to the action of fire, crippling the original stem. Ribs somewhat interruptedly tuberculated; tubercles flattened horizontally. In the youngest specimens are found already 7 radial and 4 central spines, the lower radial spine much the stoutest and quite curved, the 3 upper central spines almost radiating, the lower one erect, all stout, and 1–1½ inch long. In older specimens (the one before me is globose, 4 inches in diameter, with 13 ribs) the areolæ are 6–8 lines long, 3½–4 lines wide; the radial spines (together with the 3–5 slender additional ones on the upper edge of the areola) 12–18; the lowest one is stout and much hooked, and the shortest of all; the others are from 1½–2 inches long; the 4 central spines are 1–1½ line broad, and about 2 inches long; in the most fully developed bunches of spines the 3 upper radial spines are pushed into the inner circle, so that then the number of centrals appear to be 7. The upper central spine is the broadest one, almost straight and erect; the lower one has mostly a strong downward curve. The fruit is described by Dr. Parry as a green, juicy berry, about an inch in diameter, in the axils of the uppermost spines, with yellow remains of the corolla; seed black, "intermediate in size between that of *E. viridescens* and *E. Wislizeni.*" I was inclined to consider this plant as a form of *E. viridescens*, but Dr. Parry, who has seen numerous specimens of it, is satisfied that it is quite a distinct species. It is characterized by the cylindrical growth, more obtuse ribs, more numerous, longer, and more curved spines, of which the upper, not the lower one, is the largest and broadest. It is quite remarkable that we have three so similar species on both sides of the Californian mountains as the two just mentioned and *E. polycephalus;* the western one globose, the two eastern ones cylindrical and many-headed; these entirely dissimilar in flower and fruit, and one of the eastern and the western one so much alike. It is an interesting observation that similar but quite distinct species occur on both sides of the mountains, not only in this genus, but also in *Mamillaria* and *Opuntia;* and that no species crosses that mountain range.

12. E. POLYCEPHALUS, Engelm. and Bigelow, in Pacific Railroad Report, found by *Mr. Schott* on the Gila and lower Colorado. He notes the cæspitose growth, and the heads 5–8 inches in diameter, 10–15 inches long, with 10–15 ribs. *Dr. Bigelow's* specimens from the Mojave river were much larger, but the fruit sent by Mr. Schott leaves no doubt about their identity.

13. E. PARRYI (sp. nov.): simplex, globosus seu depressus; costis 13 acutis tuberculato-interruptis, sæpe obliquis; areolis orbiculatis, seu areola florifera contigua minore addita, ovatis albo-

tomentosis; aculeis omnibus robustis angulatis plus minus compressis albidis, radialibus 8–11 rectis seu paullo curvatis, superioribus debilioribus, lateralibus robustioribus, infimo deficiente; aculeis centralibus 4 validioribus, 3 rectiusculis sursum versis, infimo valido longiore curvato deflexo; bacca sicca oblonga squamis aristatis spinescentibus tomentoque denso albo vestita floris rudimentis coronata. (Tab. XXXII, fig. 6–7.)

Desert region southwest of El Paso towards Lake Guzman, over an area of 60 or 80 miles in extent, found by *Parry* with old fruit in January, and by *Wright* and *Bigelow* without flower or fruit in April.—I have before me only a few bunches of spines; the other data are all obtained from Dr. Parry's notes. The plant is 8 or 12 inches high by 10 or 15 inches in diameter, always simple; the ribs interrupted; upper tubercles less distinct, flattened sidewise, lower older ones transverse and very distinct grooves between the ribs about an inch deep; areolæ of the spines ½ inch in diameter, orbicular, or with the closely adjoining floriferous areola oval, about ¾ inch long. Radial spines in my specimen 8 or 9, "often as many as 11;" lower ones divergent; stoutest upper ones more slender. Central spines 4, stouter and 1½–2 inches long, somewhat bulbous at base, upper and lower one, especially the last, stoutest and longest.—This species is nearly allied to the last, but even in the absence of seeds we can distinguish it by the simple globose or somewhat depressed heads, and the white spines. I have named it after *Dr. C. C. Parry*, who by his intelligent observations and copious notes about the *Cactaceæ* of the Boundary has greatly assisted me in their elucidation.

14. E. HORIZONTHALONIUS, Lemaire, var. CENTRISPINUS: glaucus, depresso-globosus (vetustus sæpius ovatus umbilicatus); costis 8 obtusissimis latissimis; sinubus superficialibus acutis; tuberculis sulco transverso inconspicuo vix distinctis; areolis orbiculatis basi truncatis prominulis, junioribus albo-lanatis; aculeis 6–8 robustis compressis annulatis recurvatis rubellis demum cinereis, radialibus 5–7, superioribus debilioribus, infimo deficiente, centrali singulo robustiore latiore deorsum flexo; floribus ex vertice densissime lanato centralibus campanulatis; ovario tuboque lana longa dense vestito; sepalis exterioribus 60–70 subulatis linearibus et lanceolato-linearibus spinoso-aristatis atropurpureis nudis ex lana copiosissima axillari vix exsertis; sepalis interioribus sub-15 obovato-lanceolatis mucronatis axilla nudis; petalis sub-36 oblongis obtusis eroso-dentatis roseo-purpureis; stylo supra stamina numerosissima flava exserto rubello; stigmatibus 6–8 brevibus erecto-patulis; bacca rubra succosa mox desiccata lana densa involuta floris rudimentis spinescentibus coronata a basi fere persistente circumscissa decidua; seminibus subglobosis rugosis minutissime tuberculatis nigris opacis, hilo transverso ventrali; embryone exalbuminoso suberecto clavato; cotyledonibus brevissimis. (Tab. XXXI, Tab. XXXII, fig. 1–5.)

Stony soil on the summit of hills, from the Pecos to El Paso, and north to Doña Ana, *Wislizenus, Wright, Bigelow, Parry*: fl. April and May, and "continuing to put out its beautiful flowers till July."—Easily distinguished by the broad obtuse ribs. The numerous specimens examined by me are all depressed, 1½–4 inches high and 2½–6 inches in diameter; but old specimens are said to be sometimes 6–8 inches high, oblong, and even cylindric; ribs in very young specimens 5, in all the flowering plants which I have seen, 8, and "sometimes 10"; in young plants the ribs are scarcely interrupted, but in older ones they are divided by more or less shallow grooves into very broad tubercles; areolæ 6–10 lines apart, covered with long wool when young; spines mostly 6–8, rarely 9, ¾–1½ inch (and usually 1 inch) long, nearly equal in length, very variable in shape and thickness, sometimes long and slender and almost terete;

in other specimens short, stout, and broad; flower 2½ inches long, of the same diameter, open only in bright sunshine, light purple or pink; tube lighter colored; ovary very short (3 lines), globose, tips of sepals dark purple, protruding from the dense white wool which envelops the whole flower; stamens of a flower counted by Mr. Wright, 1266; berry juicy, but drying up very soon, and finally breaking off transversely, leaving the base with most of the seeds hidden in the thick wool. The seeds, even when fully ripe, look shrivelled, and are 1.2–1.5 line long; the large circular (or rather truncate and transverse) hilum is deeply immersed; embryo almost without albumen, and quite straight, with thick, very short, erect cotyledons, and a taper-pointed radicle.—Our plant seems to be a variety of *E. horizonthalonius*, which is described as having 7 straight radial spines, the lowest one a little longer than the others, and the flower pale rose-colored, with lanceolate-acuminate petals. Prince Salm's var. *β. curvispinus* seems still nearer to our plant, which has a decidedly central but no lower radial spine, just like the last and the next species; the space for the lower radial spine is covered and filled by the strongly deflexed central spine.

15. E. Texensis, Hoepf. Not observed farther west than the San Pedro and Pecos rivers. Fruit red and juicy, drying up very soon; seeds 1.2–1.4 line long, somewhat reniform, with a deep indentation including the circular hilum; testa smooth and shining, rarely (in Berlander's specimens from Matamoras, named by him *Melocactus laciniatus*,) indistinctly tuberculated; embryo curved or hooked, with the foliaceous cotyledons buried in the large albumen. (Tab. XXXIII.)

16. E. bicolor, Galeotti, var. Schottii: simplex, ovatus vel ovato-cylindricus; costis 8 obtusis tuberculatis interruptis; areolis orbiculatis; aculeis radialibus 15–17 rectis, inferioribus brevioribus teretiusculis basi bulbosis rubellis variegatis, summis 2–4 longioribus latioribus compressis albidis; aculeis centralibus 4 albidis, summo latiore longiore supra plano infra carinato recto seu paullo sursum curvato, cæteris compressis seu subteretibus brevioribus rectis; floribus magnis in vertice tomentoso subcentralibus; ovario squamis sepaloideis 10–12 reniformibus margine ciliatis imbricato, sepalis tubi 40 sensim majoribus obtusis margine pallidiore ciliatis, summis oblongis; petalis purpureis; stigmatibus 8 suberectis.

On cretaceous hills, covered with chapparal, (thorny bushes,) near Mier, on the lower Rio Grande, *Schott*: in flower in September.—Stem 4–6 inches high, 2–3 in diameter; grooves rather shallow; floral areola close to the spiniferous one, without the intervening glands which are so conspicuous in *E. longehamatus* and others, and which I find also in the Mexican forms of *E. bicolor*. The 4 upper radial spines about an inch long and flat; all the others rounded, red, paler at both ends; the lowest is the weakest and shortest one, and often somewhat curved; upper central spine 15–20 lines long; the 3 others shorter; the lower one flat above, rounded below, often reddish like the lower radial spines; flower between 2 and 3 inches long; petals bright-purple or rose-purple, gradually paler in fading; filaments springing from the whole tube down to its base. The original Mexican *E. bicolor* is distinguished by the more globose form, also by the smaller number of radial spines, (10–11,) and by the upper central spine not being carinate nor longer than the others.

17. E. intertextus, (sp. nov.): minor, ovato-globosus; costis 13 acutis interruptis subobliquis; tuberculis supra breviter tomentoso-sulcatis; areolis ovatis (in planta juniore angustioribus) approximatis; aculeis brevibus rigidis e basi albida rubellis apice fuscatis, radialibus

16–25 arcte adpressis intertextis superioribus 5–9 setaceis albidis rectis, lateralibus rigidioribus paulo longioribus infimoque robusto brevi sæpe paullo recurvatis; aculeis centralibus 4, superioribus radiales excedentibus sursum versis, inferiore brevissimo porrecto robusto; floribus parvis in vertice dense lanato congestis purpurascentibus; ovario brevissimo 5–6-squamato; sepalis tubi 20 late ovatis cuspidatis albo-marginatis; petalis 20–25 oblongis mucronatis; stylo stamina numerosissima vix superante; stigmatibus 7–8 purpureis erectis; bacca globosa sicca squamis evanescentibus subnuda basi subpersistente circumscissa; seminibus reniformibus circa hilum magnum orbiculare ventrale curvatis tenuiter verruculosis lucidis; albumine parco; embryone curvato; cotyledonibus foliaceis brevibus. (Tab. XXXIV.)

Var. *β*. DASYACANTHUS: ovatus seu conoideus; aculeis gracilibus longioribus e purpurascente cæsiis, radialibus 19–25 setaceis pluriserialibus, superioribus 7–9 gracilioribus brevioribus albidis fasciculatis, centralibus 4 vix robustioribus, superioribus 3 sursum versis reliquos excedentibus, inferiore porrecto paullo breviore. (Tab. XXXV, fig. 1–5.)

On stony ridges from the Limpia to El Paso, *Wright*, *Bigelow*, and westward, *Parry;* also towards Chihuahua, *Wislizenus*; var. *β*. common about El Paso: fl. March and April.—Stems 1–4 inches high, and a little less in diameter; areolæ 3 or 4 lines apart; upper setaceous spines pale, 2½–6 lines long, lateral spines 4–7 lines, lowest only 2–4 lines long; upper central spires 5—7 and even 9 lines, lower one 1 or rarely 2 lines long; in young plants the 13–15 radiating spines are more equal in length, and several or all of the central spines are wanting. Flowers about an inch long and wide; sepals dark purple with paler margins; petals similar, outer ones deeper, inner ones gradually lighter colored; stamens more than 650, half as long as petals. Fruit about 4 lines in diameter, tipped by the withered flower, usually with a few dry scales, with or without some wool in their axils; the base usually persistent for some time, while the upper part comes off, separating more or less regularly. Seeds nearly or quite one line long, with a very large hilum.

Var. *β*. has the flowers and fruit of var. *α*, but is a larger plant with much longer and slenderer spines, lower central spine almost as long as the others. Spines in var. *α*. appressed so that the plant resembles somewhat, and has been confounded with, *Cereus viridiflorus*. In var. *β*. the spines are loosely patulous, forming a tuft on the top; the whole plant is very similar to *Mam. dasyacantha;* the entire similarity of flower and fruit, and the intermediate forms of the spines, leave no doubt of both plants belonging together, though their external appearance is so very dissimilar.

III. CEREUS, Haw.

Subgen. 1. ECHINOCEREUS, E.[*]

1. C. VIRIDIFLORUS, E. in Wisl. Rep. *β*. CYLINDRICUS: ovatus seu plerumque cylindricus, subsimplex; costis sub-13 acutis fere interruptis; areolis confertis ovatis seu ovato-lanceolatis,

---

[*] This subgenus, which was indicated by me in the Appendix to Wislizenus' Report as a genus distinct from *Cereus*, and which Prince Salm in the latest edition of his *Hortus Dyckensis* very properly reduced to a section of that genus, is well characterized by the peculiarities of the flower and fruit pointed out in the work above mentioned. The numerous species since discovered confirm this character. The seeds, especially, are distinct from those of any other *Cactaceæ* examined by me. They are rather small, never so much as one line (between 0.4 and 0.9 line) in length, obliquely obovate or subglobose, more or less compressed, and with a circular or oblong basilar or sub-basilar hilum; testa black, hard, and brittle, always tuberculated; its tubercles large or small, equal or unequal, distinct or more or less confluent, and then leaving irregular depressions, so that the seed appears pitted or pitted and tubercled together. Embryo with little or no albumen, almost straight, or very slightly curved; the short though distinct, and even somewhat foliaceous, transverse cotyledons more or less bent, inclined to form a hook.

junioribus albo-villosis mox denudatis*; aculeis 12–18 radialibus brevibus pectinatis rigidis, adjectis plerumque supra aculeis adventitiis 2–6 brevioribus setaceis, lateralibus longioribus, inferioribus purpureis demum fuscis, superioribus plerumque albidis, rarius omnibus purpureis; aculeis centralibus nullis seu rare singulo robusto recto vel subinde curvato apice seu toto purpureo-fusco, rarissime altero graciliore superiore adjecto; floribus versus apicem lateralibus e flavo virescentibus; ovario tuboque pulvillos 25–30 (aculeolis infra 8–12, supra 3–5 albidis seu rubellis munitos) gerentibus; sepalis interioribus lineari-oblongis 10–15 virescentibus fuscatis; petalis 12–15 lineari-oblongis acutiusculis; baccis ellipticis virescentibus; seminibus parvis obovato-subglobosis tuberculatis, hilo basilari suborbiculato. (Tab. XXXVI.)

On the Limpia, and thence towards El Paso, *Wright*: fl. in May.—This is a taller form than the original species described in Wislizenus' Report, from the northern parts of New Mexico, with stouter spines and acute petals. A handsome plant, not so much on account of the inconspicuous flowers, as from the beauty of the purple and white spines, which are particularly bright when first developed in spring, and look like flowers. Stems 3–6 and sometimes even 8 inches high, 1–2 inches in diameter; spines usually 3–5 or nearly 6 lines long; central spines, if present, 6–10 lines in length, more common on the smaller northern var. *α.*, rarely present in the southern form. In a single specimen collected by *Dr. Bigelow* on the upper Pecos, I find on some of the areolæ all or most of the spines purple, and the central spine sometimes curved upwards, sometimes white, with a purple tip, or purple to the base. Flower one inch or less below the top, 1–1¼ inch long, not quite as wide even when fully open; petals 2–3 lines wide. Fruit 5–6 lines long, crowned with the withered corolla, as in all *Echinocerei;* in some rather dry fruits the corolla is quite persistent; in the more juicy ones it, as well as the spines on the fruit, are deciduous when the fruit is quite ripe. Seed 0.5–0.6 line long, tuberculated, but the tubercles somewhat confluent, very slightly in the northern form, a little more in ours, so as to show pits between the warts; seed somewhat compressed, and keeled on the back.

2. C. CHLORANTHUS (sp. nov.): cylindricus, simplex seu e basi parce ramosus; costis 13–18 subinterruptis; areolis confertis orbiculato-ovatis; aculeis 12–20 laxius radiantibus setiformibus albis, lateralibus longioribus apice sæpe purpurascentibus, adjectis supra aculeolis 5–10 brevioribus setaceis; aculeis centralibus 3–5 quorum 2 superiores breviores plerumque purpurascentes sursum divergentes, 1-3 inferiores longiores divergentes deflexique albidi; floribus in caule medio vel inferiore lateralibus virescentibus extus rufis; ovario pulvillos sub-21 (aculeolis 14–18 setaceis munitos) gerente; sepalis tubi sub-18 lineari-lanceolatis, inferioribus aculeolos axillares 3–5 gerentibus; petalis 15–18 lineari-oblongis mucronatis; filamentis styloque sulphureis; stigmatibus 8–11 viridibus adpressis; bacca subglobosa aculeolata; seminibus parvulis tuberculato-scorbiculatis. (Tab. XXXVII—XXXVIII.)

Common on stony hills and mountain sides near El Paso, *Wright*, *Bigelow*, : fl. April.—Stems 3–9 or 10 inches high, 1½–2 inches in diameter; areolæ 3 or 4 lines apart, not so much elongated as in the last species, and often almost orbicular; radial spines slender, patulous, not strictly radiating, pectinate or adpressed to the plant; lower lateral ones the longest, as in all these *Pectinati*, 4–5 lines long, inferior ones shorter, upper ones shortest; no

---

* This *tomentum* or *villus* on the young or nascent areola is so universally present, always disappearing with age, that it ceases to be a character. The differences consist only in the greater density or looseness of this tomentum, and in its color, which is almost always white, but occasionally yellowish, gray, tawny, brown, or almost black. I shall only make mention of it where it varies from the ordinary form.

central spines are present in young plants, next 1–3 appear, and well developed flower-bearing plants have always 5; the upper darker and shorter ones are about 6 lines, the lower ones 9–12 or even 15 lines long; the lowest one is the longest and regularly deflexed, so that the plant seen from above shows as many rays, formed by these spines, as there are ribs. Spines mostly white, the lower lateral and central ones often tipped with purple, upper central ones entirely purple; a specimen has been sent with all the spines almost entirely white. Flowers yellowish-green, always low down on the plant, (usually below the middle, often in the lower third) forming a circle around the stem; flowers an inch long, funnel-shaped, not fully opening even in bright sunshine. Mr. Wright, to whose careful examinations and full notes I am indebted for many data, found the stamina about 400 in number, and half as long as the petals; stigmata green, much exsert. Fruit half an inch or less in thickness, crowned with the conic remains of the flower; seed 0.5 or 0.6 line in diameter, orbicular, compressed and carinate; tubercles confluent, so as to form pits; hilum linear-oblong or oval, basilar. Name from the color of the flowers.

3. C. DASYACANTHUS, E. in Wisl. Rep.: ovatus seu subcylindricus, simplex seu e basi parce ramosus, subcæspitosus; costis 15–21 rectis seu obliquis subinterruptis; areolis confertis ovatis; aculeis 20–30 rectis rigidis patulis stellatim undique porrectis intertextis cinereis apice sæpe rubellis vel adustis, in plantis debilioribus albidis, exterioribus 16–24 quorum laterales longiores, superiores breves graciles, inferiores intermedii, interioribus 3–8 robustioribus; floribus sub vertice ipso subterminalibus magnis flavis; ovarii pulvillis 35–45 villosis aculeolos 15–18 albidos seu apice rubellos gerentibus; sepalis tubi late campanulati inferioribus 20–30 aculeoliferis, superioribus 15–20 petaloideis oblanceolatis acutis seu cuspidatis; petalis 15–25 spathulato-oblanceolatis mucronatis seu interioribus plerumque obtusis muticis; staminibus numerosissimis; stylo exserto subclavato; stigmatibus 13–18 viridibus erectis; bacca magna subglobosa aculeolata; seminibus subglobosis tuberculatis. (Tab. XXXIX, XL, et XLI, fig. 1.)

About El Paso, and down to the cañon of the Rio Grande; common on rocky hills and the edge of gravelly table-lands, where *Dr. Wislizenus* first found it in 1846, and where the gentlemen connected with the Boundary Commission have since abundantly collected it in flower and fruit, and in numerous living specimens.—The geographical range of this species seems quite limited, as it has not been sent from any other locality but the one indicated. Fl. in April and May; fr. ripe in June.—Stems 5–12 inches high, 2 or 3 or even 4 inches in diameter, densely covered by the innumerable ashy-grey or reddish spines; lower lateral spines somewhat bulbous and compressed at base, 6–7 lines long, upper ones 3–4 lines, and lower ones about 5 lines long; upper central spines shorter than the lower ones, these are the stoutest and of about the length of the lower external spines, or a little longer. Flowers large and numerous, from the upper axillæ of the past year's growth, before the growth of the same spring is much advanced, so that they appear terminal or central at first glance, as they cover the top of the plant; this is the case with many spring-flowering *Echinocerei;* others, (e. g. the last mentioned species,) produce their flowers lower down on the plant from older axillæ. Flower 3 inches or more in length, and of the same diameter, very showy, externally greenish yellow, with the centre of sepals red; petals bright yellow; stamens counted by *Mr. Wright*, over 1700, with yellowish green filaments; pistil stout; stigmata thick, erect. Flower (like those of most *Echinocerei*) open in bright sunshine only, about the middle of the day, closing in the afternoon, but reopening the next, or even the third day, unless the weather be very hot, when all the functions of the flower are performed in one day. Fruit subglobose, 1–1½ inch in diameter, green or greenish purple, when fully ripe "delicious to eat, much like a gooseberry." Seeds 0.6 line long, subglobose, very little oblique, with an oblong basilar hilum, strongly and distinctly tuberculated, like those of *C. cæspitosus;* embryo almost straight, or rather the cotyledons slightly bent forward.

4. C. CTENOIDES (sp. nov.): subsimplex, ovatus; costis 15–16 obliquis subinterruptis; areolis lanceolatis confertis; aculeis rigidis albidis demum cinereis intertextis, radialibus 14–22 pectinatis basi bulbosa lateraliter compressis arcte adpressis sæpe subrecurvis, lateralibus longioribus, summis brevissimis, centralibus 2–3 raro 4 uniseriatis abbreviatis robustis basi bulbosis; floribus versus apicem lateralibus campanulatis flavis; ovarii ovati pulvillis sub-40 aculeolos 12–16 breves setaceos albidos seu apice fuscatos gerentibus; tubi campanulati sepalis inferioribus 30 squamiformibus ad axillas setis 3–10 munitis, sepalis interioribus 12–15 lanceolatis acutis intimis obtusis, omnibus mucronatis; petalis 25–30 spathulatis obtusis retusis vel obcordatis denticulatis flavis basi angustata virescentibus; filamentis numerosissimis virescentibus brevibus; stylo albido; stigmatibus 10–12 obtusis erecto-patulis viridibus. (Tab. XLII.)

From Eagle Pass to Santa Rosa, *Bigelow*; on the Pecos, *Wright*; fl. June and July (in St. Louis).—Stems 2–4 inches high, 1½–2½ inches in diameter; aspect of plant very similar to *C. pectinatus*, to which I allude by the Greek name, of the same meaning. Areolæ about one line long, also about one line apart; spines whitish or ashy, and in some specimens with light brown tips; sometimes I find only 14–16 radial spines, (1 upper, 1 lower, and 6–7 pairs of lateral ones); the older and larger ones have 7–9 pairs of lateral spines, 1 lower one, and often 3–5 small bristly upper spines. Upper spines ½–1 line, lower one 1—2 lines, and the others 3–4 lines long. Central spines in a single longitudinal series one above the other, 1–3 lines long. Flower bright yellow, with a light green centre and dark green stigmata, open from 8 or 9 till one o'clock, 2½–3¼ inches long, 2½–3½ inches in diameter, the broad and obtuse petals forming an even uninterrupted margin all around. Ovary with 38–44 pulvilli, scales obsolete, wool short, bristles about 15 in each bunch, 2–3 lines long. Pulvilli of tube 25–35, with green fleshy sepals, the lower ones with 8–10 short, and the upper ones with 3–4 longer (5–6 lines long) bristles; petals 1½–1¾ inch long, ½ inch wide, lower part of the tube narrow, and for about 1½ line naked inside; filaments very numerous and very slender; anthers small pale yellow; stigmata rather slender, 3 lines long. Our plant looks distinct enough from *C. dasyacanthus*, which is taller, has a larger number of ribs, rounder and shorter areolæ, patulous and usually more numerous spines, and more and longer central ones, also flowers almost vertical, with stouter spines on their tube; but it may, after all, be only a form of it, just as *Echinocactus intertextus* and *E. dasyacanthus* belong together, and as *C. viridiflorus* and *C. chloranthus* may be joined; intermediate forms, however, have not yet been observed. It has already been stated that the flowerless plant so closely resembles *C. pectinatus* that it can hardly be distinguished from it except by the fewer ribs; the color of the flowers, to be sure, is very different, but, though no instance is yet known among *Cerei* where yellow and purple flowers are found in the same species, this may not be impossible, and we may possibly have to unite all these forms.

5. C. PECTINATUS, E., var.? RIGIDISSIMUS: ovato-cylindricus; costis 20–22 interruptis; areolis lineari-lanceolatis confertissimis, junioribus parce lanosis; aculeis omnibus radiantibus arcte adpressis subrecurvis e basi bulbosa subulatis acutissimis rigidissimis albidis flavidis rubellisve subpellucidis, lateralibus 12–16 longioribus robustioribus, infimo singulo vix breviore,

superioribus 3–6 setaceis brevibus fasciculatis; floribus sub vertice lateralibus; ovarii pulvillis 50–60 aculeolos 8–12 rigidos gerentibus; sepalis tubi 40 inferioribus subulatis ad axillam aculeiferis, superioribus 20 lanceolatis acuminatis; petalis sub-20 spathulatis acutiusculis incisota-dentatis purpureis; stigmatibus sub-12; bacca ovato-globosa aculeolata; seminibus tuberculatis.

In the Sierras of Pimeria Alta in Sonora, and farther west, *A. Schott*: fl. June and July.—Stems 4–8 inches high, 2 inches in diameter; areolæ 2–2½ lines long in the larger full-grown specimens, 3 or 4 within one inch of the rib; in a small specimen, with only 15 ribs, smaller areolæ and smaller and more numerous spines (30–35, only 1–1½ line long); 12 or more bunches of spines are crowded within the same space. Spines all radiating and interlocking, extremely rigid and acute, variegated, the latest ones of each season being rose-colored, and the earliest ones a pale yellowish, thus forming variegated rings around the stem. Lateral spines 3–4½ lines long, lower one 2 lines long, upper ones still shorter. Flowers near the depressed vertex, just on the outer edge of the rounded top, 2½–3 inches long, bright pink, or purple. Fruit subglobose, nearly an inch long, pulpy and edible; the fleshy part of the stem is also eaten by the inhabitants, who call this plant "Cabeza del Viejo." Seed (not quite ripe) 6 lines long, strongly tuberculated, closely resembling that of *C. cæspitosus.* I can distinguish this plant from *C. pectinatus* only by the greater rigidity and thickness of the radial, and the entire absence of the central spines. The forms allied to *C. pectinatus* are very difficult to distinguish, and it is quite probable that they may run into one another, as Dr. Poselger, who has seen thousands of them in Texas and Northern Mexico, is inclined to think. I find that *C. pectinatus* has always a distinct single inferior spine, which is only a little shorter than the lower lateral spines; while *C. cæspitosus* has generally several of the lowest spines much shorter and weaker than the lateral ones. *C. adustus*, the flower of which is not yet known, has fewer ribs, oval areolæ, and the lowest spine much as in *C. pectinatus.*

6. C. CÆSPITOSUS, E. in Pl. Lindh., which extends from the Arkansas river to Saltillo, has been found by *Mr. Wright* as far west as the Nueces and the San Pedro. The loose darkish wool and slender bristles on the extremely numerous (80–100) pulvilli of the flower-tube, and especially the position of these pulvilli,—not in the axil, but considerably above it on the sepal, just below its foliaceous tip,—distinguish this species from the nearly allied *C. pectinatus,* as well as from all other *Echinocerei* known to me. This structure of the sepals seems to imitate and explain the morphology of the tubercles in *Mamillaria,* demonstrating them not to be a branch or an axis, but the fleshy petiole of an abortive or depauperate leaf, which sometimes is indicated by an indistinct scale above the fasciculus of spines, or by the point of the tubercle of an *Anhalonium.* This species has 12–18 ribs, 20–30 radial spines, rarely with 1 or 2 central ones here and there; flower 2–3 inches in diameter; petals sometimes, though rarely, curly, as in our figure, mostly plain; stigmata 12–18; fruit 9–10 lines long, oval, generally bursting irregularly; seed 0.6–0.7 line long, obovate, oblique, sometimes almost globose, very strongly tuberculated, with an oval hilum. The name *C. cæspitosus,* which would apply much better to a number of other species of this section, was given before any of these were known; it not inaptly represents a common state of the plant when it makes 5–12 heads, but not rarely it is almost or quite simple. (Tab. XXXIII—XXXIV.)

7. C. LONGISETUS, (sp. nov.): subsimplex, ovato-cylindricus; costis 11–14 interruptis tuberculatis; areolis orbiculatis; aculeis setaceis flexilibus albis patulis radialibus 18–20 rectis basi

bulbosa compressis, superioribus tenuioribus brevioribus, inferioribus longioribus, centralibus 5–7 bulbosis, quorum superiores radialibus vix longiores, 1–3 inferiores elongati divaricati deflexi sæpe flexuosi. (Tab. XLV.)

Mountains about Santa Rosa, in Coahuila, *Bigelow.*—Stems simple, or somewhat branching at base, 2–3 inches in diameter, 6–9 inches high; ribs fewer, more distinctly tuberculated, and less compressed than in most other species, and easily distinguished thereby. and by the orbicular areolæ, from the otherwise similar-looking, pale-spined forms of *C. chloranthus.* Upper radial spines 2½–3 lines, lowest and lateral ones 6–7 lines long; upper central spines hardly longer than these; lower central ones always 3 in well-developed plants, 1½–2 or even 2¼ inches long. Flower and fruit of this peculiar and pretty plant as yet unknown; the former said to be red. Name from the length and slenderness of the spines.

8. C. Rœtteri, (sp. nov.): ovato-cylindricus; costis 10–13 interruptis; areolis ovato-orbiculatis subconfertis; aculeis e basi bulbosa subulatis rubellis apice obscuris demum cinereis, exterioribus 8–15 additis sæpe supra aculeis centralibus, lateralibus longioribus, infimo singulo breviore; aculeis centralibus 2–5 robustioribus plerumque sub-brevioribus; floribus sub vertice lateralibus magnis purpureis; ovarii pulvillis 20–24 aculeolos 10–15 albidos fuscatosve gerentibus; sepalis tubi inferioribus aculeoligeris sub-15 triangulari-lanceolatis, superioribus 8–10 oblanceolatis spathulatis; petalis 8–12 spathulatis; tubo intus basi nudo; stigmatibus 10–12 viridibus suberectis stamina numerosissima brevia longe superantibus; bacca subglobosa; seminibus oblique obovatis compressis inæqualiter tuberculatis subscrobiculatisque, hilo basilari parvo oblongo. (Tab. XLI, fig.3–5.)

Sand-hills south of El Paso, *Bigelow;* near El Paso or Frontera, *Wright:* fl. April.—A single living specimen, preserved in the Congressional Garden in Washington, is 5 inches high and 2½ in diameter, and has 12 ribs; areolæ in this and the dried specimens are 4–6 lines apart; lower lateral spines 5–7 or 8 lines long, lowest one a little shorter, upper ones 2–3 lines in length; central spines usually only 4–6 lines long, rarely one or the other longer; always stouter than the others, and with very thick and bulbous bases. Flowers 2½–3 inches long, purple, very similar to the flower of *C. Fendleri* or *C. enneacanthus;* fruit 8–10 lines long, and rather less in diameter; seeds 0.7 line long, strongly but irregularly tuberculated; tubercles here and there somewhat confluent. In the arrangement of its spines this species considerably resembles *C. dasyacanthus,* and I have formerly taken it for a smaller variety of that species; but it differs from it by the smaller number of ribs, the fewer and stouter spines, which place it almost intermediate between the *Pectinati* and the *Decalophi,* the red flower, the small fruit, and the larger and irregularly tuberculated seed. I take great pleasure to acknowledge my indebtedness to the modest and faithful artist, *Mr. Paulus Rœtter,* who has adorned this memoir by his skillful pencil, by naming this species after him.

9. C. Fendleri, E. in Pl. Fendl.: simplex, seu parce e basi ramosus, ovatus seu ovato-cylindricus, perviridis; costis 9–12 rectis seu obliquis tuberculato-interruptis; areolis orbiculatis, junioribus dense tomentosis subconfertis; aculeis basi bulbosis, radialibus 7–10 rectis seu sæpe curvatis, inferioribus robustioribus, infimo 4-angulato albido, sequentibus 2 obscuris, cæteris albidis seu sæpius fusco-variegatis, superioribus tenuioribus pallidis, summo deficiente seu robusto elongato curvato; aculeo centrali valde bulboso teretiusculo elongato fusco-atro sursum curvato rarissime deficiente; floribus magnis purpureis subverticalibus; ovarii tubique pulvillis 25–35 aculeolos 3–12 albos sæpe adustos gerentibus; sepalis interioribus 12–15 lineari-

lanceolatis seu spathulatis acutis seu cuspidatis; petalis 16–24 oblongo-linearibus seu obovato-spathulatis acutis seu obtusis mucronatis sæpe eroso-denticulatis; stigmatibus 12–16 stamina numerosissima vix superantibus erectis; bacca ovato-globosa ex viridi purpurascente pulvillis aculeolatis 18–20 stipata; seminibus oblique obovatis curvatis paullo compressis scrobiculatis (tuberculis irregulariter confluentibus,) hilo ovato seu subcirculari basilari; embryone paullo curvato.

In various situations, among rocks or in alluvial river-bottoms from Santa Fé, *Fendler;* to the cañon of the Rio Grande below El Paso, *Wright*, *Bigelow;* and from the country fifty miles east of the Upper Pecos westward to Zuñi and the Aztec mountains, *Bigelow*, and to the Copper mines, *Thurber:* fl. May and June.—Stems single or few together, 3–8 inches high, 2–3 inches in diameter, not many together, and those usually of unequal height, not level-topped, like *C. phœniceus* and others; areolæ 4–7 lines apart; spines very variable, but always characterized by their bulbous base, by the lower ones being stouter and longer than the upper ones, partly white and dark, and by the long and dark central spine, which is always curved upwards. Radial spines mostly 7, a white and angular one below, 6–12 lines long; the two next ones hardly longer, more terete, black on the upper and usually white on the lower surface; then comes a pair of white or rarely variegated spines, scarcely shorter, above them two weaker, whiter, and shorter spines, 3–6 or 7 lines long. This is the usual form, especially in the north; often, however, two more upper spines are found, and sometimes a slender, or oftener a stout and dark-colored spine, not rarely 12–15 lines long, is placed on the upper edge of the areola, similar to, but always smaller than, the central spine. All these forms are occasionally seen on the same specimen. In some southern specimens I observe now and then a few small additional upper spines. The form which I have described in *Pl. Fendlerianæ* as *β. pauperculus*, and which *Dr. Bigelow* collected also on the Pecos, has mostly only six spines: five lower and lateral radial ones and the central one, which, more or less, assumes the place of the absent upper radial spine. This, however, is not a constant form, as transitions to the usual arrangement of spines are often seen on the same specimen. Central spine very much thickened at base, almost terete, black, often with a lighter tip, curved upwards, 1–2 inches long. Flower $2\frac{1}{2}$–$3\frac{1}{2}$ inches long and wide, not fully open before noon, closing again after 2 o'clock; spines on the ovary $2\frac{1}{2}$–4, on the upper part of the tube 4–8 lines long, distinctly bulbous at base, and often angular; petals 4–7 lines wide, acute or obtusish; stamina about 1600 in a specimen examined by *Mr. Wright*, only from the upper and wider part of the tube, the lower and narrow part 3–4 lines long, naked. Fruit 1–$1\frac{1}{4}$ inches long, purplish-green, edible; seeds 0.7 line long, very oblique, irregularly pitted by the tubercles, as it were, running together in twisted lines.

10. C. ENNEACANTHUS, E. in Wisl. Rep.: ovato-cylindricus, obtusus, læte viridis, simplex seu plerumque dense cæspitosus; costis 7–10 obtusis infra dilatatis sursum compressis tuberculatis sulco transverso sæpe interruptis, sinubus profundis acutis; areolis orbiculatis remotis; aculeis rectis, radialibus 7–12 (plerumque 8) albis subpellucidis, inferioribus longioribus, centrali singulo (raro 2 superioribus tenuioribus additis) basi bulboso teretiusculo seu plerumque plus minus compresso triangulatoque albido stramineo seu obscuriore radialibus longiore; floribus subterminalibus seu lateralibus; ovarii pulvillis 25–35 in squamæ triangularis axillis villosis aculeolos 6–12 albidos seu fuscatos gerentibus; sepalis tubi inferioribus 18–20 cum aculeolis longioribus paucioribus, superioribus 10–18 oblanceolatis acutis; petalis 12–15 oblongo-obovatis erosis obtusis acutisve; stigmatibus 8–10 viridibus elongatis erectiusculis; bacca

subglobosa e purpureo virescente; seminibus minutis obovatis subobliquis tuberculatis, hilo oblongo. (Tab. XLVIII, fig. 2–4, and tab. XLIX.)

Along the Rio Grande, from El Paso, *Wright*, *Parry*, to Eagle Pass, *Schott*, *Bigelow*, and into Mexico, *Wislizenus:* fl. April and May. A widespread species, assuming many forms, sometimes approaching the next. Stems generally branching and cæspitose, 3–6 inches high, 1½–2 or 2½ inches in diameter, fresh green, in winter often reddish; even when in full growth appearing flaccid or shrivelled. Areolæ 6–10 lines apart; spines remarkably transparent, much smaller on the lower part of the plant than on the upper one, all bulbose at base, especially the central ones. Upper radial spines 3–5 lines, lateral ones 5–12 lines, lower ones 8–16 lines long, all usually less than one inch. In some specimens the radial spines are almost equal in length; in others they differ very much. Central spine extremely variable in color, size and shape; when young usually yellowish or brownish, at last ash-colored; in younger plants terete; in perfectly developed ones triangular and flattened, 8 or 10 to 15 or 20 lines long; sometimes we find one or two additional shorter and angular central spines above the principal one, diverging upwards. Flowers 2–3 inches long, and of the same and even greater width when fully open; the smallest were obtained at Eagle Pass, bright purplish-red; these have more numerous as well as slenderer and shorter spines on the ovary, and bloom earlier; the larger flowers come from El Paso and Chihuahua, from larger plants with longer spines. Berry 10 or 12 lines long, greenish or purplish, pleasant to eat; seed 0.5 line or less in the longest diameter, its tubercles very prominent and distinct.

11. C. STRAMINEUS, (sp. nov.): ovato-cylindricus, versus apicem attenuatus, læte viridis, cæspitosus densissimeque agglomeratus; costis 11–13 sursum compressis obtusis tuberculatis transverse sulcatis; areolis orbiculatis remotis; aculeis radialibus 7–10 (plerumque 8) rectis seu paullo curvatis basi bulbosis teretibus seu inferioribus subinde angulatis albis subpellucidis subæqualibus; aculeis centralibus subquaternis basi bulbosis angulatis elongatis radiales longe excedentibus sæpe flexuosis stramineis fuscatis, nascentibus sæpe roseis seu purpureis, superioribus sursum divergentibus, inferiore latiore porrecto seu paullo deflexo; floribus lateralibus grandibus; ovarii squamis 30–40 triangularibus et sepalis tubi late campanulati 20–30 inferioribus oblongis abrupte cuspidatis in axilla villosa aculeolos paucos flexuosos elongatos gerentibus; sepalis superioribus 10–15 oblongo-obovatis obtusis seu cuspidatis; petalis 15–18 late obovatis obtusis eroso-denticulatis; stigmatibus 10–13 elongatis erecto-patulis; bacca ovato-subglobosa magna purpurascente aculeolis elongatis numerosis deciduis armata; seminibus obovatis obliquis tuberculatis; hilo oblongo parvo; cotyledonibus subcurvatis. (Tab. XLVI—XLVII et tab. XLVIII, fig. 1.)

On high gravelly table-lands, and on the mountain-slopes about El Paso, extending east to the Pecos and west to the Gila, *Wright*, *Bigelow*, *Parry:* fl. June; fruit ripe in July and August.—A most remarkable plant, on account of the immense masses it forms, one plant often consisting of 100 or 200 heads in a regular hemispherical mass, which is covered and defended by the long, flexuous, straw-colored spines: those have suggested the specific name of the plant. Single heads 5–9 inches high and 2–3 inches in diameter, tapering towards the top, at base closely impacted together. Areolæ in vigorous plants ¾–1 inch apart, in older plants becoming more approximate. Radial spines ¾–1¼ inch long, on the lower part of the plant shorter. Central spines 2–3 or even 3½ inches long, straight or variously twisted, and the younger ones red or brown. Flower 3 or 4 inches in length, and spreading as wide or wider, appearing very full from the broad (8–12 lines) and numerous petals of a bright purple or deep pink color, inclining to crimson. Ovary with only few spines (2–4 lines long) on each pulvillus; the spines on the tube more numerous and about twice as long. These spines increase in number and length during the growth of the fruit, so that at maturity we find 8 or 10 in each fascicle, ½ to 1 inch in length. Fruit 1½–2 inches long, 1½ inch thick, readily shedding the spines, purple, of a delicious taste, intermediate between a strawberry and a gooseberry. The small seeds (0.5–0.7 line long) cannot be distinguished from those of the last species. The tubercles are large for the size of the seed and very distinct.

12. C. DUBIUS (sp. nov.): ovato-cylindricus, pallide viridis, cæspitosus; costis 7–9 obtusis tuberculatis; sinubus latis parum profundis; areolis orbiculatis remotis; aculeis albidis subpellucidis, radialibus 5–8 teretibus seu subangulatis, superioribus sæpe deficientibus, centralibus 1–4 bulbosis angulatis elongatis rectis seu incurvis; floribus lateralibus; ovarii pulvillis 20 in squamæ triangularis axilla parce villosa aculeolos paucos breves gerentibus; sepalis tubi inferioribus 16–20 ovato-lanceolatis cum aculeolis 1–3 longioribus; sepalis superioribus sub-10 oblongo-spathulatis obtusis; petalis sub-10 spathulatis obtusis pallide purpureis; stigmatibus 8–10; bacca subglobosa virescente-purpurea fasciculis aculeolorum 8–12 elongatorum deciduis armata; seminibus globoso-obovatis obliquis confluento-tuberculatis, hilo circulari. (Tab. L.)

Sandy bottoms of the Rio Grande, and from El Paso, *Wright*, *Bigelow*, to below Presidio, *Parry*, with *Algarobia*, *Fouquiera*, and *Larrea*; fl. June and July.—Stems 5–8 inches high, not so densely cæspitose as the last one, of a pale green color and soft flabby texture; ribs few, broad; grooves shallow; radial spines 6–12 or 15 lines long, lower ones longer than upper ones, or the upper spines very commonly entirely wanting, and replaced by the three upper central ones; central spines 1½–3 inches long, the lower one somewhat stouter and longer than the upper ones. Flower 2½ inches long, of the same diameter; petals fewer and narrower than in the last species, only 6 lines wide, paler, (rose-colored,) and mostly quite obtuse and almost entire. Ovary in this, as in the last species, remarkably small and undeveloped, while the flower is fully open; its spines few and short, growing afterwards in length and numbers more than is noticed in any other species. Ripe fruit 1–1½ inch long, with 20–24 pulvilli, on each of them 9–12 bristly spines, 4–9 lines long; fruit green or rarely purplish, insipid or pleasantly acid. Seed larger than in the two last species, 0.6–0.7 line long, subglobose-obovate, with a circular hilum; the tubercles not distinct as in the others, but confluent, and forming pits in the interstices.—These three species are very nearly allied, but are said to be easily distinguished in their wild state; the characters given above are said to be quite constant, and seem to establish them as good species.

13. C. ENGELMANNI, Parry in Sill. Journ. 1852: ovato-cylindricus, e basi parce ramosus; costis 11–13 interruptis; areolis orbiculatis subconfertis, junioribus villosis; aculeis radialibus 13 sub-angulatis albidis apice adustis rectis seu paullo curvatis, lateralibus 6 longioribus, inferioribus 3 vix brevioribus, superioribus sub-4 parvis; aculeis centralibus 4 angulatis gracilibus rectis multo longioribus, inferiore longiore albido porrecto seu deflexo, superioribus fulvis arrectis; floribus sub apice lateralibus; ovarii pulvillis sub 30 aculeolos rigidos 8–14 gerentibus; sepalis tubi inferioribus 15–20 ovato-lanceolatis ad axillam villosam aculeiferis; petalis purpureis; stigmatibus 12 erectis viridibus; bacca ovata; seminibus oblique obovatis tuberculato-foveolatis, hilo subbasilari oblongo. (Tab. LVII.)

Mountains about San Felipe, on the eastern declivity of the Californian Cordilleras, *Parry;* common in the Gila valley, especially near the Casa Blanca, above the Pimas village, *Schott*: fl. in June.—Loosely cæspitose, not more than 4 or 6 or at most 8 stems together; stems 5–10 or even 12 inches high, 2–3 inches in diameter; radial spines 3–6 lines long; central ones 1–2 inches long, upper one the shortest, lower one the longest. Flower rather low down on the plant, between 2 and 3 inches long; fruit at last naked, fleshy, 1½ inch long, an inch in diameter; seed 0.6–0.7 line long, similar to that of *C. Fendleri*, to tubercles running together, and forming irregular pits.

14. C. POLYACANTHUS, E. in Wisl. Rep.: ovato-cylindricus, plerumque ramosissimus, cæspitosus, glaucescens; costis 9–13 subcompressis obtusis interruptis; areolis suborbiculatis remotiusculis seu demum confertis; aculeis teretibus robustis rigidis rectis albidis seu e cinereo rubellis apice obscuris demum totis cinereis, exterioribus 8–12 parum bulbosis, lateralibus longioribus, centralibus 3–4 bulbosis paullo robustioribus æquilongis seu longioribus, junioribus sæpe corneo-fuscoque variegatis; floribus sub vertice lateralibus diu noctuque apertis; ovarii pulvillis 16–20 tomentosis aculeolos 6–15 variegatos gerentibus; sepalis tubi inferioribus 10–12 triangulari-lanceolatis aculeiferis, superioribus lineari-lanceolatis seu oblanceolatis spathulatisve mucronatis seu summis obtusis; petalis 18–22 spathulatis obtusis integris seu erosis chartaceis coccineis basi pallidioribus erecto-patulis; tubo intus basi nudo, staminibus brevibus; stylo exserto; stigmatibus sub-8 erectis; bacca subglobosa; seminibus majusculis irregulariter tuberculatis; hilo subbasilari parvo angusto; embryone parcissime albuminoso; cotyledonibus brevibus incurvis. (Tab. LIV–LV.)

A common plant at El Paso, *Wright*, *Bigelow*, *Parry*, *Thurber*, and as far south as the mountains west of Chihuahua, *Wislizenus*, on table-lands and mountains, and also on sand-ridges or stony hills: fl. March and April, fr. in June.—Heads 5–10 inches high, 2½–4 inches in diameter, pale green or glaucous; areolæ ½–1 inch apart; spines very variable; exterior ones not strictly radiating but spreading; upper ones about 6 lines; lateral and lower ones 9–12 lines long; central spines in young specimens single, in older and more perfect ones always 3–4; in some hardly longer than the radial ones, 9–12 lines long, but usually longer, and sometimes 2 or even 2½ inches long; lower central spine always longer than the others. Flowers 2–3 inches in length, spreading not quite so wide, remaining open day and night, often for 4 or 5 days, and profusely adorning the plant for 4 or 6 weeks in succession; petals rigid and somewhat concave, rounded, of a deep red or blood color; the base of the tube inside naked for 3 or 4 lines; stamens about 600; berry ¾–1¼ inch long, greenish-purple, of a pleasant gooseberry taste; seeds larger than in any other *Echinocereus* known to me, 0.8–0.9 line long, oblique; hilum small subbasilar; embryo with some albumen, (which is not common in this genus,) large, a little curved; cotyledons almost foliaceous, approaching the form observed in the cylindric *Cerei*.

15. C. PAUCISPINUS (sp. nov.): ovatus seu ovato-cylindricus, perviridis, simplex, seu parce ramosus, costis 5–7 interruptis; sulcis latis sursum acutis; areolis remotis; aculeis 3–6 seu rarius 7 robustis basi bulbosis rectis seu subrecurvis radiantibus, infimo pallidiore, cæteris rufis fuscisve, omnibus demum nigrescentibus, centrali nullo seu rarius singulo robusto subangulato atrofusco sursum verso seu porrecto; seminibus obovatis obliquis subconfluento-tuberculatis, hilo basilari elliptico. (Tab. LVI.)

From the San Pedro to the mouth of the Pecos, on rocks and gravelly limestone hills, *Wright*, *Bigelow*.—Stems 5–9 inches high, 2–4 inches in diameter, not cæspitose like the last species to which it seems to be allied, but either simple or with few branches from near the base; ribs few, grooves wide and shallow; areolæ 8–10 lines apart; spines few and dark colored, 9–15 lines long, upper one often shorter, and central spine when present 15–20 lines long; flower and fruit unknown; the seed sent by Mr. Wright is similar to that of *C. polyacanthus*, 0.7–0.8 line long, oblique, with slightly confluent irregular tubercles, and a large and wide hilum.—This species on the Pecos seems to take the place of the more western *C. polyacanthus*, which farther east is represented by *C. Rœmeri*, and farther west by *C. phœniceus*; from all these it is distinguished by the few ribs and the few dark spines.

16. C. BERLANDIERI (sp. nov.): humilis, perviridis; caule subtereti articulato-ramosissimo; tuberculis conicis distinctis 5–6-fariis; areolis parvis orbiculatis; aculeis tenuibus subsetaceis, 6–8 brevibus radiantibus albidis, 1 centrali plerumque multo longiore fuscato; floribus lateralibus magnis purpureis; ovarii puvillis sub-20 breviter albo-tomentosis aculeolos capillaceos basi bulbosos 8–10 longiores albidos et 1–2 robustiores fuscos gerentibus; sepalis tubi exterioribus 8–10 aculeoliferis, superioribus 13–16 oblongo-linearibus acuminatis seu cuspidatis; petalis 14–18 late linearibus seu lineari-oblanceolatis elongatis fere loricatis mucronatis apice denticulatis patulis demum reflexis; stigmatibus 7–10 viridibus; bacca ovata viridi subsicca; seminibus parvis obovato-subglobosis tuberculatis, hilo circulari.—(Tab. LVIII.)

On the Nueces, *Berlandier*. Frequently in cultivation under the wrong names of *C. repens* or *C. Deppii*, doubtless introduced from southern Texas: fl. May and June.—A spreading and procumbent plant, with erect branches contracted at base, and thereby articulated, 1½–6 inches long, ¾–1 inch thick, either terete with distinct spirally disposed tubercles, or the tubercles arranged in 5 or 6 ribs. Areolæ 4–6 lines apart; radial spines bristle-like, weaker than those of the next species, 4–5 lines long, sometimes a stouter and darker one at the upper end of the areola; central spine yellowish-brown, shorter on the lower part of each branch, longer towards the top, from 5–6 to 10–13 lines in length. Flower 3–4 inches long, or when fully open spreading almost 4 inches and only 2 inches in height; bristles of the tube below 2–3 lines, upwards 4–6 lines long, the tomentum white and short; petals long and narrow, 3–4 or rarely 5 lines wide, bright rose-purple; filaments short, pale rose-colored; stigmata long and suberect; berry about 9 lines long, densely covered with the elongated mottled hair-like spines; seeds 0.5 line long, strongly and distinctly tuberculated, contracted at base. Nearly allied to *C. pentalophus*, DC., which, however, is an erect plant.—Named for *Dr. J. L. Berlandier*, who made known this as well as many other plants of the lower Rio Grande.

17. C. PROCUMBENS, E. in Pl. Lindh. 1850: humilis, perviridis; caule subtereti seu 4–5 angulato articulato-ramosissimo; tuberculis distinctis spiralibus seu 4–5 fariis; areolis parvis-orbiculatis; aculeis rigidis brevibus albidis apice fuscis, 4–6 radiantibus, centrali nullo seu singulo paullo longiore obscuriore; floribus sub apice ramorum lateralibus magnis; ovarii pulvillis sub 25 albido-villosis aculeolos rigidos 6–9 breves variegatos gerentibus; sepalis tubi exterioribus 12–15 aculeoliferis, superioribus sub-15 lineari-lanceolatis acuminatis; petalis 18–20 lineari-spathulatis acutis seu obtusis, integris seu plerumque eroso-dentatis patulis demum recurvis violaceis basi flavidis; stigmatibus 10–14 stamina flavicantia superantibus; bacca ovata viridi irregulariter dehiscente; seminibus parvulis lenticularibus basi hilo oblongo truncatis verruculosis. (Tab. LXIX, fig. 1-11.)

On the Rio Grande below Matamoras: fl. May and June.—Similar in habit to the last, but more slender; branches ½ to 3 or 4 inches in length, 6–8 lines in diameter; tubercles 4–5 lines apart, in 4 rows when the branches appear acutely quadrangular, or in 5 rows when they are more terete. Radial spines 1–2 lines long, central one on lower part of joint wanting, or hardly longer than the radial ones, on the upper part 2–4 lines long. Flower about 3 inches long and of same width; petals often reflexed, 4–6 lines wide. Fruit 6 or 8 lines long; seed between 0.4 and 0.5 line long, much compressed, with a narrow hilum; its tubercles very much smaller than in the last species. Our plant bears a close resemblance to the last mentioned one, but may always easily be distinguished by the characters enumerated.

18. C. TUBEROSUS, Poselger: e radice tuberosa tenuissimus, teres, lignosus, sursum sensim incrassatus, cylindricus, demum articulatus parceque ramosus, debilis, erectus seu geniculatus et reclinatus; costis 8 vix prominulis; areolis parvis confertis, junioribus parce sordide tomentosis; aculeis 9–12 radiantibus parvulis subulatis albidis rectis adpressis, inferioribus paullo longioribus, centrali singulo e basi crassa subulato longiore toto seu versus apicem fusco sursum arrecto; floris subterminalis (?) tubo brevi; pulvillis squamatis albo-lanatis aculeolatis; sepalis superioribus 8 lineari-lanceolatis; petalis 16 oblanceolatis acuminato-aristatis roseis patentibus; filamentis brevibus; stylo elongato; stigmatibus 8 viridibus; bacca subsicca villosa setosaque floris rudimentisque coronata; seminibus minutis oblique obovatis compressis tuberculato-rugosis scrobiculatis. (Tab. LXIX, fig. 12.)

On the Texan side of the Rio Grande, between Reynosa and Camargo, *Dr. Poselger;* on the Chacon hills, 3 miles below Laredo, and also near Mier, on arid rocky ridges, always among shrubs, "which support its weak and otherwise almost decumbent stem," *A. Schott.*—Tuberous root globular, $\frac{3}{4}$–$1\frac{1}{2}$ inch in diameter; stem 1–2 feet high; lower part ligneous, scarcely as thick as a quill; upper younger part and branches 4–8 lines in diameter; young branches few, clavate; ribs very little prominent; areolæ 1–2 lines apart; radial spines a line long or less; central spine 2–3 lines long, in weak specimens whitish, in robust ones the upper half or the entire spine brown or black, rigidly erect and appressed, generally reaching to the second areola above. The flower, which I have not myself seen, is described by Dr. Poselger in a letter as being terminal, "so that the ovary is a complete continuation of the stem." I suppose that it rises from the upper, but certainly not the recent areolæ; and that it cannot be truly terminal, i. e., a continuation of the axis, which would be in opposition to the character of the whole family. Schott also figures the plant as bearing fruit at the end of the branches. Flower over 2 inches long and of the same diameter, opening for several days, but only in bright noonday sunshine; ovary and tube covered with very woolly pulvilli in the axils of reddish scales, with 6 or 8 long white or black bristles; petals rose-colored or purple, about an inch long. Fruit covered with long wool and black and white bristles, resembling very much that of *C. cæspitosus.* Seed smaller than that of any other *Cereus* examined by me, only 0.4 line in the largest diameter, rugose from confluent tubercles which leave large pits between them. Albumen none; embryo almost straight, with distinct transverse cotyledons. Flower, fruit, and seed identify this species with the *Echinocerei,* thus furnishing another instance, if such were still needed, of the importance of the organs of fructification in the study and arrangement of the *Cactaceæ,* and of the fallacy of expecting the external shape of these plants to furnish characters for generic or subgeneric division. Without the knowledge of the flower and fruit, *C. tuberosus* would no doubt have been classed with the *Cerei articulati,* while in reality it is the slenderest *Echinocereus,* connected with the ordinary ovate or globose forms through *C. Berlandieri* and *C. procumbens.*

Subgen. 2. EUCEREUS.*

19. C. EMORYI, E. in Sill. Journ.: caule cylindrico 2–3-pedali prostrato; ramis adscendentibus seu erectis; costis 15 tuberculatis; sinubus acute incisis; areolis confertis orbiculatis, junioribus fusco-tomentosis; aculeis rectis rigidis gracilibus aciculatis e virescenti flavis numerosissimis intertextis, exterioribus 40–50 tenuissimis stellatim porrectis, centrali singulo robustiore multo longiore; floribus subterminalibus flavis; tubo breviusculo aculeolato; bacca globosa aculeatissima; seminibus magnis obovatis acute carinatis basi acutis lucidis minutissime sub lente tuberculatis, hilo ventrali angusto; cotyledonibus foliaceis hamatis incumbentibus. (Tab. LX, fig. 1–4.)

On dry hills and mountains, near the coast of California, about San Diego, growing in thick masses, and covering patches of 10 or 20 feet square, *Dr. Parry;* not north of the boundary line, *Dr. Le Conte.*—Prostrate stems 2–3 feet long; branches 6–9 inches high, 1½ inch in diameter; flowers abundant near the top of the branches, rather short, yellow, 2 or 2½ inches wide. Fruit 1½ inch in diameter, densely covered with numerous pulvilli, each bearing 20 or 25 stiff yellow spines, from 2 to 6 lines in length, 3 of them stouter and longer than the rest, often about an inch in length; some indistinct remains of the dead flower are hidden among the spines. Seed 1.2–1.4 line long, with a very prominent keel and linear hilum. The short aculeolate flower, persistent on the spinose fruit flower, would seem to refer our plant to *Echinocereus,* but the seed and embryo permit no doubt about its position. I have seen specimens of a fruit of a columnar *Cereus* from the Pacific coast near Mazatlan, sent by the late Dr. J. Gregg, which is a gigantic representative of our California fruit, and suggests the idea that on the western coast of our continent several species exist of a still unknown section of *Cereus.*—This plant, peculiar to the western termination of our boundary line, fitly bears the name of the energetic and distinguished commissioner under whose auspices the greater part of the interesting plants here described have been collected.

20. C. VARIABILIS, Pfeiff., a tall species, 3–10 feet high, is common to the east as well as west coast of tropical America, extending northward to the mouth of the Rio Grande, and up that stream towards Matamoras. Full-grown stems 3–4 angled, with few and stout spines; but young shoots with 8 ribs and numerous slender spines; flowers white, nocturnal; fruit oval, about 3 inches long, spinose, crimson externally and internally; seeds obliquely obovate, compressed, smooth, and shining, 1.5–1.7 line long; hilum subventral, narrowly oblong, linear, albumen almost none; embryo much curved; cotyledons large, foliaceous, incumbent. (Tab. LX, fig. 5–6.)

21. C. GREGGII, E. in Wisl. Rep.: e radice crassa napiformi erectus, gracilis, 2–3-pedalis; ramis paucis erectis 3–6-angulatis atro-virentibus sæpe rufescentibus; costis acutis; sulcis latis planiusculis; areolis oblongo-linearibus confertis seu subconfertis, junioribus lana e cinereo

---

* This section is proposed here only as a receptacle for our few *Cerei* not included in the other subgenera. It is not impossible that the greater part of the species of this genus will have to be referred here, but it is more probable that a careful examination of the flower and fruit of the numerous southern *Cerei* will necessitate the formation of several other subgenera. Not being familiar with the great majority of the species, I refrain from characterizing *Eucereus.* I will only state that the few species referred here have an elongated stem; spines on the flower-bearing and sterile part of the plant not different; tube of the flower elongated and beset with hairy or spiny pulvilli; stigmata whitish; berries usually with deciduous (or persistent?) spines; dry remains of the flower usually at length deciduous; seeds mostly smooth and shining, and the embryo hooked, with curved foliaceous cotyledons.

nigricante demum decidua vestitis; aculeis e basi bulbosa crassa abrupte subulatis acutissimis brevissimis nigricantibus, vetustis cinereis, radialibus 6–9 subrecurvis, infimis 3 tenuioribus longioribus, centralibus binis superimpositis brevibus, rarius singulo; floribus lateralibus albidis seu ochroleucis (nocturnis?); ovarii ovati pulvillis orbiculatis obscuro-villosis vix aculeolatis; tubi elongati sepalis 40–60 squamiformibus linæri-lanceolatis acuminatis, inferioribus aculeolos paucos breves, superioribus plures capillares gerentibus; sepalis interioribus 15–20 et petalis totidem lanceolatis acuminatis; stylo stamina æquante; stigmatibus sub-10 erecto-patulis albidis; bacca ovata basi contracta apice rostrata floris rudimentis siccis recurvis demum deciduis coronata pulvillis aculeoligeris mox nudatis munita coccinea pulposa; seminibus magnis oblique obovatis rugosis tenuissime tuberculatis; hilo subbasilari circulari; albumine parcissimo; embryone cotyledonibus foliaceis incumbentibus hamato.

Var. *α.* CISMONTANUS: areolis elongatis; floris tubo minus gracili aculeolis brevioribus munito; petalis latioribus. (Tab. LXIII, LXIV.)

Var. *β.* TRANSMONTANUS: areolis ovato-orbiculatis; floris tubo graciliori aculeolis longioribus tenuiter capillaceis flexuosis munito; petalis lineari-lanceolatis longe acuminatis. (Tab. LXV.)

From the San Pedro in western Texas, *Parry*, *Wright*, *Bigelow;* to the Gila, *Emory;* and Sonora, *Thurber*, *Schott;* and from the Rio Grande, south to Chihuahua, *Gregg*, *Wislizenus*, in gravelly or hard clayey soil, nowhere a common plant: fl. May and June.—Root a large fleshy, dirty-yellowish tuber, often 4–6 inches in diameter and 6–10 inches long, generally producing but one stem 2–3 feet high, with erect branches; stem thin at base, rather terete and ligneous, upwards 9–12 lines in diameter, usually 4–5, angled. The acute ribs at first sight seem crenulated, the pulvinate areolæ being separated by a slight depression, and the spines being scarcely visible without a close examination. Areolæ 1–1½ line long, in younger shoots 5–6 within one inch of the rib, in older plants about 3 areolæ in the same space. Spines remarkably short and sharp from a disproportionately thick base, only ½–1 line long; the 3 lowest spines are the longest, and run into a fine bristle-like point, often somewhat curved and not rarely crossing each other; above them 2 or usually 3 pairs of lateral spines, points of the lower ones diverging downward, and of the upper ones rather upward; central spines mostly 2, very short and thick, the lower one turned downward, the upper one upward. The spines seem to grow in size for several years, as on the older part of the stem they are twice as thick, though not any longer than the younger ones; they also become irregular, some of the smaller apparently dropping out, while the larger ones crowd into the vacant space, (see figure.) The flowers have been seen by only *Dr. Gregg* and *Mr. Thurber;* they seem to be nocturnal, as the latter gentleman collected them in the early morning hours, commencing to fade. Ovary 9–12 lines long, whole flower 6–8 inches long, about 2½ inches in diameter; bristles at base of tube 1–2 lines, or upwards 4–6 lines, and in var. *β.* 6–10 lines long; style not reaching above the large anthers; stigmata about 10, suberect. Berry ovate, 1¼–1½ inch long, an inch in diameter, slightly contracted at base, but not stiped nor even clavate, as I formerly was induced to believe, somewhat rostrate at the upper end, bright scarlet, fleshy, and edible. Seeds 1.2–1.5 line long, 1 line thick, with a large hilum; the warts of the testa are flat and very minute, but the large wrinkles are very distinct to the naked eye. The young seedling has quite short cotyledons, which finally form a thickened ring around the base of the young stem; this stem is always triangular, of a reddish-brown color, the edges showing an almost continuous line of the characteristic small and sharp spines; the root very soon swells, as our figure shows, and assumes the shape of a small carrot, almost as large as the stem itself; in old specimens the root is very much larger than the whole stem and branches together.

Subgen. 3. LEPIDOCEREUS.*

22. C. GIGANTEUS, E. in Emory's Rep. 1848: erectus, elatus, cylindricus, versus basin apicemque sensim attenuatus, simplex seu parce ramosus, candelabriformis; ramis paucis erectis caule brevioribus; vertice applanato tomentoso; costis infra sub-13 sursum 18–21 rectis, vetustis (versus caulis basin) obtusis obtusissimisque, sursum e basi lata acutatis acie obtusatis subrepandis; sinubus ad basin caulis latissimis versus apicem profundis acutis angustioribus angustissimisque; areolis prominentibus ovato-orbiculatis, junioribus albido-tomentosis; aculeis rectis basi valde bulbosis tenuiter sulcatis et subangulatis albidis seu stramineis demum cinereis; radialibus 12–16, imo summisque brevioribus, lateralibus (præcipue inferioribus) longioribus robustioribus, subinde aculeis adventitiis paucis setaceis summo areolæ margini adjectis; aculeis centralibus 6 robustis albidis basi nigris apice rubellis demum totis cinereis, 4 inferioribus cruciatis quorum infimus longissimus validissimus deflexus, 2 superioribus brevioribus lateralibus sursum divergentibus; floribus versus apicem caulis ramorumque aggregatis; ovarii ovati sepalis 30–40 squamiformibus triangulatis acutis ad axillam albido, seu fulvo-villosam aculeolum unum alterumve nigricantem deciduum gerentibus; sepalis tubi ampliati breviusculi 30–40 orbiculato-subdeltoideis mucronatis, inferioribus in axilla lanigeris, superioribus nudis; sepalis intimis 10–15 spathulatis obtusis carnosis (pallide viridibus albescentibus); petalis sub-25 obovato-spathulatis obtusis integris crispatis coriaceo-carnosis crassis (ochroleucis seu albidis); staminibus numerosissimis superiori tubi parti adnatis, inferiore nudo; stylo stamina paullo superante; stigmatibus 14–18 filiformibus fasciculatis; bacca obovata seu sæpe pyriformi squamis triangulatis carnosis parvis ad axillam lanatis munita, floris rudimentis deciduis; pericarpio duriusculo coriaceo demum valvis 3–4 irregularibus patulis reflexisve dehiscente; seminibus numerosissimis in pulpa saccharina coccinea nidulantibus oblique obovatis lævibus lucidis exalbuminosis; hilo oblongo basilari; cotyledonibus foliaceis incumbentibus hamatis. (Tab. LXI, LXII, et tab. front.)

In rocky valleys and on mountain sides, often in mere crevices of rocks, from the valley of Williams' river, lat. 35°, *Bigelow*, to Sonora, lat. 30°, *Thurber*, *Schott;* and from the middle Gila, *Emory*, down to near its mouth, *Parry*. I cannot find that it has been collected west of the Colorado, though it is probably also an inhabitant of the Californian peninsula: fl. May to July; fruit ripe in July and August. The *Suwarrow* or *Saguaro* of the natives.—Young plants, as *Dr. Bigelow* observed, are almost always found under the protecting shade of some shrub, especially of Frémont's "green-barked Acacia" (*Cercidium Floridanum*) so characteristic of the barren wilderness; and not rarely the dead stems of this plant are found near the older *Cerei*. Young plants retain their globose shape for several years; a specimen in my possession, 5 or 6 inches high, is supposed to be between 8 and 10 years old. It flowers at the height of 10 or 12 feet, but grows up to 4 or 5 times that height; stems have been measured 46 feet high, and higher ones are stated to occur, so that the first statement of *Col. Emory* is not at all improbable, viz: that this plant sometimes has been found 50–60 feet high. The stem is thickest in or a little above the middle, and tapers upwards and downwards; one was found by *Dr. Bigelow* to be at one foot above the ground 13 inches, and 10 feet higher more than 23 inches, in diameter. The fleshy part of the plant is, as he notes, bitter, and not acidulous, as in most species of Cacti. The ligneous skeleton consists of thick (1–2 inches thick) and somewhat terete perpendicular bundles of fibres, corresponding in number and position to the grooves of the stem; in younger plants and on the upper part of the older ones these sticks are distinct, and sway in the wind like so many reeds, but at the lower part of the older stems they are reticulately connected with one another by ligneous tissue, the open meshes corresponding (just as in the cylindric *Opuntiæ*) with the bunches of spines or tubercles; in the oldest stems the inner cavity becomes nearly filled by the same tissue. Stems mostly simple; older ones often with a few erect branches; they are rarely much branched, but specimens have been observed where 5–9 branches sprang from the same part of the main stem; the primary branches very rarely produce secondary ones. The branches usually drop off from the skeleton of the dead stems; but in very old specimens they remain, and present a view like the one in our landscape plate opposite the title-page, which is taken from an accurate sketch made on the spot by *Mr. Mœllhausen.*—Ribs at the base of the stem few (12–15), broad, obtuse, often almost obliterated, and generally without spines; higher up the number of ribs increases to about 18–21; they are triangular with an obtusish edge, separated by deep triangular acute grooves; towards the top of the plant the young ribs are narrowly compressed, with obtusish edges and narrow grooves between them. The somewhat pulvinate areolæ are 7 lines long, nearly 6 lines in diameter, about an inch distant from one another, sometimes more closely approximate; at first they are covered with a thick yellowish or tawny tomentum. Lower and upper radial spines 6–12 lines long, sometimes a few additional shorter flexuous setaceous spines are placed above; lateral ones 12–18 lines long, the lower ones longest; the 4 lower central spines straight, or very slightly curved downwards 20–30 lines, the 2 upper central spines 15–18 lines long, diverging upwards. The stoutest spines are one line in diameter, their bulbous base fully twice as thick. In old age, and towards the base of the stem the 6 central spines fall off first, leaving the radiating ones appressed to the stem; finally these also come off, together with the whole areola. The flowers are produced in abundance near the summit of the stems and branches; the fruit is usually found 6–12 inches from the centre of the top. Specimens of flowers have been sent by *Mr. Thurber* and by *Mr. Schott;* those of the former are not over 3 inches long; the others have a longer tube, and are between 4 and 5 inches in length and 3–4 inches in diameter; the flowers are probably open day and night. Ovary 1–1⅓ inch long; lower scales of the tube triangular; upper sepals fleshy, greenish-white, ¾–1 inch long, lower ones 2, upper ones 3–4 lines wide; petals of a light cream color, 1–1½ inch long, 6–8 lines wide above, very thick and fleshy, and very much curled. Filaments light yellow, adnate to the upper half of the tube, its lower part for the length of 1 or 1½ inch naked. Stigmata over half an inch long, slender, suberect, of a greenish-yellow color. Fruit 2½–3 inches long, 1½–2 inches in diameter, oval or obovate, or often narrowed at base and almost pear-shaped, (perhaps where many are crowded together;) the remains of the flower falling off leave a broad convex scar; the color of the fruit is green, and towards the upper end reddish. The pericarp has the hardness of a green cucumber, somewhat softer towards the apex, and is about 2 lines thick; it bursts open on the plant with 3 or usually 4 valves, which are red on the inside, and when spreading horizontally, or somewhat recurved, look like a red flower. The crimson-colored sweet but rather insipid pulp has the consistency of a fresh fig; it completely separates from the rind, and, drying up from the heat of the sun, falls to the ground. The innumerable black seeds are 0.7–0.9 line long. Those brought by *Mr. Thurber*, and largely distributed in this country and in Europe, have well germinated; the cotyledons are short and acute; the seedling plant is globose, grows very slowly, and is rather delicate.

---

* This subgenus is proposed for the two tall western species with uniform spines, short flowers, ovary and tube with numerous scale-like imbricated sepals, fleshy petals, pale stigmata, smooth seeds, and hooked embryo. Probably *C. Chilensis*, and perhaps other species from the Pacific slope of the continent, will find their place here. A drawing of *C. Chilensis*, among the papers of the United States Exploring Expedition, represents a flower almost identical with that of *C. Thurberi*.

23. C. Thurberi, E. in Sillim. Journn.: caulibus erectis seu adscentibus elatioribus fasciculatis articulatis 13–14-costatis; sinubus planiusculis; areolis subremotis pulvinatis griseo- seu fulvo-tomentosis; aculeis 7–15 gracilibus rectis flexuosisve fusco-atris demum cinereis valde inæqualibus irregulariter fasciculatis; floribus infra caulis apicem lateralibus aggregatis; ovarii squamis sepaloideis 80–100 pluribusve triangularibus imbricatis axilla lanam copiosam albidam sel fulvam sæpeque aculeolos paucos nigricantes gerentibus; sepalis tubi sub-50 olivaceis, inferioribus acutiusculis, superioribus obovato-spathulatis obtusis; petalis obtusis carnosis albidis; bacca magna globosa aculeolata demum nuda olivacea intus coccinea; seminibus numerosissimis oblique obvatis dorso carinatis læviusculis (sub lente minutissime tuberculatis) lucidis exalbuminosis; hilo oblongo subbasilari, embryone cotyledonibus foliaceis curvatis incumbentibus breviter hamato. (Tab. LXXIV, fig. 15.)

In a rocky cañon near the mountain pass of Bacuachi, Sonora, *Thurber;* on all the sierras of Sonora westward of the Sierra Madre, and more common southward, *Schott;* called there *Pitahaya:* fl. June and July; fruit in July and August.—Stems 5–15 from one root, fasciculated, erect or ascending, "curved *inward*," 10–15 feet high, articulated, lower joints 2–3, upper ones 5–6 feet long, 4–6 inches in diameter; ribs 13–14, very slightly prominent. The skeleton of this species, according to *Mr. Schott's* observations, consists of flattened bundles of wood, very loosely connected by transverse fibres, so as to form a kind of hollow tube. Areolæ pulvinate covered with brownish or ashy wool, only about three lines in diameter, 12–15 lines apart. Spines irregularly fasciculated, 7–10, according to *Mr. Schott's* notes; but 15 in the flower-bearing bunches before me. (Might not the flower-bearing spines be more numerous and perhaps more slender than the others, indicating a transition to *Pilocereus?*) Spines slender, flexible, almost setaceous, very uneqal in length, 5–18 lines long in the same bunch, partly deciduous. Flowers usually 6–12 inches below the top of the plant, about 3 inches in length; ovary very densely imbricate with sepaloid scales, which bear dirty wool and often short bristly spines in their axils; in some specimens they are wanting, in others they also invest the fruit, but are easily brushed off at maturity. Fruit 3 inches in diameter, like a large orange, of delicious taste, the crimson pulp dotted with numerous black seeds. These are 0.9–1.0 line long only, a little larger than those of the last species, which they very much resemble, and very minutely tuberculated. The seeds germinate like those of *C. giganteus*, with very short acute cotyledons, and grow up with a globose head like the *Echinocerei* while all the *Eucerei* which I have seen germinating at once grow up in a cylindric or prismatic column.

Subgen. 4. Pilocereus.*

24. C. Schottii, (sp. nov.): caulibus suberectis elatioribus fasciculatis articulatis 4–7-(plerumque 5-) costatis flavo-viridibus; areolis in caulibus sterilibus remotis aculeos radiales

---

* *Cereus Schottii*, described in the text (evidently a *Pilocereus*, as that genus has been established by Lemaire) leaves no doubt in my mind about the propriety and necessity of a reunion of the "*Old man Cactus*" and its allies with *Cereus*. As a subgenus, *Pilocereus* would be characterized by the difference of the sterile and the flower-bearing parts of the plant, (the latter having more numerous. longer, and thinner, often hair-like spines,) and by the smaller flowers with all the parts reduced in number The other characters ascribed to *Pilocereus* (filaments from the whole surface of the tube and even from the top of the ovary, and especially the short and globose cotyledons,) are not found in our species.

4–6 robustos breves cinereos obscuros singulumque centralem breviorem obscuriorem gerentibus, in caule superiore florifero confertis lanam cinerascentem aculeosque 15–25 setiformes elongatos flexuosos angulosos rubello cinereos declinatos et quasi pendulos ferentibus; floribus in aculeorum barba pene occultis carneis; tubo gracili supra ovarium globosum 10-squamatum constricto decurvo intus basi nudo sepalis 10–12 lanceolatis instructo; petalis 10–12 oblongis obtusiusculis; stigmatibus 5–6 fasciculatis; bacca parva globosa squamosa pulposa coccinea floris rudimentis coronata; seminibus oblique obovatis carinatis lævissimis lucidis, hilo angusto subventrali; albumine parcissimo; embryone hamato cotyledonibus curvatis foliaceis incumbentibus seu subinde obliquis. (Tab. LXXIV, fig. 16.)

Sierra di Sonoyita, and southeast towards Santa Magdalena, Sonora, where it is named *Zina*, or *Sina*, or *Sinita* by the inhabitants, *Schott*: in August with flower and ripe fruit. —Stems 8–10 or more from the same base; 8–10 feet high, ascending at base, and, when full grown, always curved outward at the top, the reverse of *C. Thurberi*; often many plants together, forming thickets, and covering a large space of ground; not rarely associated with the just-mentioned species. Stems of 2–4 articulations of 4 or 5 inches diameter; lower part entirely denudated of the quite deciduous spines. Spines of the sterile joints, or young plants, 5–7, not over 3 or 4 lines long; areolæ of the flowering joints 3 lines in diameter, covered with a dirty whitish tomentum, 2–3 lines apart; spines irregularly fasciculated, 10–25 in number, and from 1 to 4 inches long, flexuous and pendulous. Flower somewhat hidden in this reddish-grey beard, and its tube evidently bent downward by it; length of flower 1½–1¾ inch; sepals without any wool in the axils, olivaceous; lower ones triangular, acute; upper ones lanceolate; petals dirty flesh-color; stamina comparatively few, leaving the top of the ovary and the lower part of the tube naked; stigmata 5–6, filiform, broom-shaped, exactly like those of *C. giganteus* or *C. Thurberi*. Berry scarlet, 3 or 4 lines in diameter; seeds very similar to those of *C. giganteus*, but larger, 1.0–1.2 line long; germination very much like that of the last two species; cotyledons of seedling plant acute, short, spreading; head globose, but soon somewhat elongated, while both others remain globose for a long time. *C. Schottii* is closely allied to *Pilocereus scoparius*, Poselg. from Vera Cruz. This, however, is a larger plant, 20–25 feet high, 1 foot in diameter, with 12–15 ribs on the sterile, and 20–25 on the flowering part. I have named this interesting species, the only *Pilocereus* of our Flora, after its zealous discoverer, whom I have often had occasion to mention in these pages, and who, with all his other arduous duties in the field, still found leisure and inclination to study the Botany of the boundary from the Pacific to the Gulf of Mexico.

IV. OPUNTIA, Tourn., Mill.*

Subgen. 1. STENOPUNTIA.

Articuli complanati. Aculei non vaginati.
Flores parvi. Petala parva, subulata, erectiuscula (aurantiaca).
Stigmata pauca (1–3), acuta.
Bacca? et Semina?

---

* Besides its strictly differential characters (viz: the rotate corolla and the flat bony seeds with large foliaceous cotyledons) this genus is distinguished from the other Cactaceæ by its subterete, subulate and deciduous leaves, and by its barbed spines, which I do not find in any other plant of this family. These spines render *Opuntiæ* so much more disagreeable and even dangerous than other *Cacti*; in several species (*O. fragilis*, *O. Bigelovii*, *O. frutescens* and others) the joints easily separate from the stem and adhere by their barbed spines to the skin or clothes of the passer-by, the most annoying burs. Besides these spines which are

The habit of the two species, the only ones yet known, is entirely that of the next subgenus; but the small flower (less than 1 inch in diameter) has numerous very small and narrow petals, and few and acute stigmata. *O. grandis*, the only other species known, has 2 or 3 stigmata, and *O. stenopetala* only one stigma. I must remark here, that all the ovaria I have opened contained no ovules and not even a cavity. May not the acute single style (an unique and anomalous case in this family) be in some connexion with this sterility, and may these flowers not be abortive or staminate forms?

1. O. STENOPETALA (sp. nov.): prostrata; articulis magnis crassis; pulvillis ad marginem confertissimis fusco-setulosis; aculeis sub-3 compressis ancipitibus curvato-deflexis seu patulis, adjectis sæpe 1–3 minoribus, omnibus atrofuscis; floribus ex areolis fulvo-villosis; ovari obconici tuberculati pulvillis 30–40 confertis albido-tomentosis setosis; sepalis tubi petalisque sub-25 lineari-subulatis acuminatis aristatis aurantiacis erecto-patulis; imo tubo nudo; stylo medio globoso-ventricoso apice indiviso acuto staminibus sub-breviore. (Tab. LXVI.)

Common on the battle-field of Buena Vista, south of Saltillo, Mexico, *Dr. J. Gregg*, 1848: fl. July.—The specimens before me consist of dried segments of joints, bearing flowers; joints apparently large, perhaps 7 or 8 inches in diameter, pulvilli about $1\frac{1}{4}$ or $1\frac{1}{2}$ inch apart on the surface, but much crowded towards the edges, with much dirty-white wool, short dark brown bristles, and very dark, almost black, spines, lighter at the tip. The stouter spines $1\frac{1}{2}$–2 inches long, flat on the upper, rounded on the lower surface, often much curved. Floriferous pulvilli very woolly; ovary about 9 lines long, leaves (or sepals) on the tubercles deciduous, very slender, 2–$2\frac{1}{2}$ lines long; sepals and petals 4–6 lines long, not more than one line broad at base, very slenderly acuminate, fleshy; sepals greenish-red; petals orange. Stamens numerous, half as long as the petals; style very much inflated in the middle, and to all appearances (I have carefully examined about six flowers) with a single pointed stigma. No fruit or seed was obtained, nor is it probable that these flowers would have ripened fruit, as no ovula could be found. Cannot this curious plant be obtained living? It is interesting to find in the Mexican *O. grandis*, mentioned above, (which has long been cultivated in European gardens, but has only lately, for the first time, flowered in Prince Salm's collection,) a very similar species, confirming this subgenus; this is an erect plant, with smaller joints, two white spines on the pulvilli, and 2 or 3 acute stigmata.

---

usually, although not in every species, present, bristles are almost invariably found on each pulvillus, usually small, (less than 1 or 2 lines long, sometimes longer) and very numerous, mixed with soft wool. These bristles are extremely sharp and barbed backward, like the spines, and are loosely attached at their insertion; consequently, when touched, they come off from the plant and adhere most annoyingly to the skin or clothing. Both the *areola aculeifera* and the *areola florifera* are united in this genus into one circular or oblong *pulvillus* in the axil of the deciduous leaf. The spines occupy the lower, and the bristles the upper part of this *pulvillus;* between the bristles, and surrounded by them, and always above the spines, the young shoots or flowers originate. These bristles correspond with the bristles and wool in the axils of some *Eumamillariæ*, and with the tomentum of the floriferous areola in *Coryphantha* and *Echinocactus*, but are quite distinct, morphologically, from the spines themselves. In *Eumamillaria* the aculeiferous and floriferous areolæ are entirely separate; in *Coryphantha* they are united by a long groove; in *Echinocactus* by a short one, or are quite contiguous, although always distinct; in *Cereus* we do not observe a persistent floriferous areola; the flower, as well as the young bud, bursts the epidermis above and close to the spiniferous areola, where a kind of floriferous areola is formed and continues till soon after the fall of the fruit, when it gradually disappears. In all these plants, the floriferous areola occurs only on the fully developed part of the plant, capable of bearing flowers. But in *Opuntia* the pulvillus (which in its lower part is the spiniferous, and in its upper part the floriferous areola combined, is the same in all stages of development; only it is smaller on the lower part of each joint, and bears fewer or often no spines, and rarely if any flowers or new shoots; while the uppermost *pulvilli* have the longest and most numerous spines and bear the flowers as well as the young branches. The *pulvilli* of *Opuntiæ* continue to grow year after year, and the bristles become longer and more numerous, and in many species the spines themselves grow stouter; sometimes new spines are developed between the bristles, indicating a low degree of continued vegetative activity on the rudimentary axis represented by the floriferous areola.

Subgen. 2. PLATOPUNTIA.

Articuli complanati, lanceolati, elliptici, obovati seu suborbiculati. Aculei nunquam vaginati.

Flores majores seu magni. Petala latiora, obovata seu orbiculata, flava seu rarius miniata, rarissime purpurascentia.

Stigmata plura (5–10) obtusa.

Bacca floris rudimentis dejectis late umbilicata, pulposa seu succosa, et inermis, rarius sicca et aculeata.

Semina margine latiore seu angustiore cincta.

Embryo plus quam circularis circa albumen parcum spiraliter convolutus. Cotyledones semper contrariæ, incumbentes.

This is the well-known form of *Opuntiæ*, with compressed and more or less elliptic joints, decumbent or erect, with fibrous or sometimes tuberous roots, mostly with spines only on the upper, or in one section (*Xerocarpeæ*) on all the pulvilli, rarely (principally the *Pubescentes*) spineless. Flowers commonly 2–3 inches and sometimes even 4 or 5 inches, in diameter; stigmata, as far as my observation goes, always from 5 to 8, or at most 10, in number, whitish, yellowish, or green, patulous or mostly erect. Fruits often edible, so that some species are cultivated for their fruits, and have been introduced into the warmer parts of the other continents; in the section *Xerocarpeæ* the fruits are spiny and dry. Seeds among the largest in the whole genus, or even in the whole family, in some species over 3 lines in diameter.

2. O. STRIGIL (sp. nov.): suberecta; articulis ovatis obovatis seu orbiculatis obtusis seu subinde subacutis tenuibus; pulvillis confertis, junioribus albido-villosis mox setis difformibus stramineis stipatis, omnibus aculeiferis; aculeis rufis fuscisque versus apicem flavidis, 5–8 radiantibus deflexis, versus margines articuli cum 1–2 robustioribus longioribus erectis patulis seu deflexis; bacca parva subglobosa late umbilicata areolis 25–30 minutis stipata rubra; seminibus parvis crassis obtuse marginatis. (Tab. LXVII.)

Western Texas, west of the Pecos, in crevices of flat limestone rocks, *Wright*, *Bigelow*.—About 2 feet high, pale green; joints covered with numerous pulvilli, each with a bunch of bright red-brown spines, paler at the tip, which give this plant a very showy appearance. Joints 4–5 inches long, 3½–4 inches wide; pulvilli 4–6 lines apart, prominent; their whitish wool soon disappears, leaving them covered with fine pale-yellow bristles, a dozen of which are longer than the rest, radiating upwards and laterally, and by joining the lower radiating spines forming with them a complete circle. Spines on most areolæ 5–8, on the lower ones (as usual) fewer, shorter and paler, on the upper and marginal ones more perfect; exterior radiating spines 3–4 lines, lower ones 5–8 lines long; the 1 or 2 stouter somewhat compressed spines on the upper areolæ are nearly an inch long, deep-brown below, light red-brown in the middle, gradually fading into yellow at the point. Flower unknown. Fruit 6–7 lines long, about 6 lines thick, with a broad and flat umbilicus; areolæ small, with grey wool and a few bristles. Seed 1½ line in diameter, rather irregular, very thick in proportion.—It would be desirable to obtain living specimens of this showy species, which could be easily done by travellers on the now well-frequented road between San Antonio and El Paso.

3. O. ENGELMANNI, Salm: erecta, grandis; caule demum lignoso tereti cortice cinereo rimoso obducto; articulis orbiculato-obovatis seu obovatis magnis pallide viridibus; pulvillis

remotis griseo-tomentosis; setis flavis rigidis valde inæqualibus sparsis; aculeis paucis (in areolis superioribus plerumque 2–3) validis compressis seu angulatis rectis seu subinde curvatis deflexis seu varie divergentibus stramineis corneisve basi rufis, cum adventitiis inferioribus 1–2 gracilioribus pallidioribus sæpe deficientibus; floribus flavis intus rubellis; ovario obvato-subgloboso seu rarius elongato subclavato sepalis e basi lata subulatis et pulvillis 20–25 griseo-sue fulvo-tomentosis parce setosis instructo; sepalis tubi sub-13, exterioribus ovato-lanceolatis acuminatis, interioribus orbiculato-obovatis cuspidatis; petalis 8–10 obovatis subspathulatis obtusis mucronatis; stylo crasso parum tumido; stigmatibus 8–10 erectis; bacca globoso-obovata seu rarius pyriformi late umbilicata; seminibus minoribus sub-irregularibus plerumque anguste marginatis. (Tab. LXXV, fig. 1–4.)

From the Canadian river, *Bigelow*, to New Braunfels, in Texas, *Lindheimer*, and to the mouth of the Rio Grande; westward to the Pecos and Presido, *Bigelow*, El Paso, *Wright*, and perhaps to the Pacific, *Parry*, south to Chihuahua, *Wislizenus:* fl. May and June.—A stout, coarse-looking plant, 4–6 feet high; lower part of old stems woody with loosely reticulated ligneous fibres, and with grey bark often covered with lichens, about 6 inches in diameter. Joints, in the larger specimens, one foot long, 9 inches in diameter; leaves subulate, 3–4 lines long, patulous; pulvilli 1¼–1½ inch apart, 3–4 lines in diameter; bristles coarse, sparse and very unequal; longer ones on the upper edge of the pulvillus sometimes 4–6 lines long; spines 1–1½ inch long, lower smaller ones 6–9 lines long. Flower 2½–3 inches in diameter, characterized by the usually quite short ovary, and the comparatively narrow and not emarginate petals; ovary commonly 1–1¼ inch long, almost globose; in some instances, however, I have seen it clavate and nearly 2 inches long, (perhaps then sterile and inclined to become proliferous.) Fruit subglobose, somewhat contracted at base, nearly 2 inches long; umbilicus about an inch in diameter, flat or a little depressed; fruit dirty purplish, usually with a bright purplish pulp, of an insipid or even nauseous taste. Seeds usually less than 2 lines, in most specimens only 1.5–1.7 line in diameter, of a regular (from Matamoras) or commonly more irregular twisted shape, with an obtuse or acutish, rather narrow margin. Young plants, raised from seed, are characterized by the fascicles of very long (¾–1 inch) fine woolly hairs on the pulvilli, which appear in the second season, and remain for several years. Among the numerous varieties of this species, the var. *cyclodes*, from the Upper Pecos, has been described in Capt. Whipple's Pacific Railroad Report; another one was collected, by Mr. Wright, on the Limpia, with 1–6 stout, curved spines on the upper pulvilli, and none at all on the lower ones.

Dr. Bigelow distinguishes from this species another plant, which he has frequently observed near Presidio del Norte and Eagle Pass. From his notes, and from the meagre material on hand, I venture to describe it, without asserting its specific difference from the last species.

O. DULCIS (sp. nov.): adscendens, patula; articulis obovatis; pulvillis remotis; setis fulvis difformibus, exterioribus confertis tenuioribus brevioribus subæqualibus, interioribus uniseriatis robustioribus multo longioribus; aculeis 2–3 angulatis sæpius tortis pallidis deflexis, sæpe cum 1–3 gracilioribus; bacca ovata late umbilicata pallida; seminibus minoribus regularibus anguste marginatis. (Tab. LXXV, fig. 5–7.)

A sub-erect, spreading bush, lower and with smaller joints than the last species, and always with a very sweet and pleasant-tasted fruit. Plant about 2 feet high; joints ½ foot long; spines 1–1¾ inch in length, almost white; a semicircle of short spines or long bristles distinctly separates the spiniferous from the bristly part of the pulvillus; the bristles themselves are much more numerous, finer, and more crowded than in *O. Engelmanni;* this arrangement of the bristles I find again only in *O. chlorotica*, Eng. & Big., from the Western Colorado The spines resemble *O. tortispina*, Eng. & Big., the flower and fruit *O. Engelmanni*, and the seed seems different from all these. Fruit 1½–1¾ inch long, one inch in diameter; umbilicus ¾ inch wide, shallow. Seeds 1.5–2.0 lines in diameter.

O. OCCIDENTALIS, E. & B. in P. R. R., found by *Dr. Bigelow*, "in immense patches, 40 miles east of Los Angeles," California, was also observed by *Mr. Schott* in the high valleys of San Pascual and Santa Isabel, northeast of San Diego, "covering extensive tracts of land." It is probably a good species, and quite distinct from *O. Engelmanni;* young plants, raised from Dr. Bigelow's seeds, do not show the peculiar capillary spines of that species mentioned above.

Another *Opuntia* grows on the hillsides and plains near San Diego, *Parry*, and on the sea beach there, *Schott;* an erect plant, 4–6 feet high; spines 2–4, stout, compressed yellowish or brownish, also forming large thickets; joints 6–8 inches long and 4–6 inches wide; ovary subglobose, with 16–20 bristly pulvilli; 15–18 broadly obovate cuspidate sepals; about 8 (?) orbiculate petals; 8–10 stigmata; a large yellowish or purple fruit, of pleasant taste, much relished by the inhabitants. Whether this is a form of *O. Engelmanni* or *O. Tuna*, which, from having for a long while been cultivated about the settlements, may have become naturalized, I cannot at present determine.

4. O. MACROCENTRA (sp. nov.): adscendens; articulis magnis suborbiculatis tenuibus sæpe purpurascentibus; foliis gracilibus lineari-subulatis; pulvillis subremotis orbiculato-ovatis setas graciles breves fulvas tomentum griseum vix superantes gerentibus plerisque inermibus, summis et marginalibus solum armatis; aculeis 1–2 rarius pluribus prælongis rectis seu varie flexuosis fusco-atris sursum pallidoribus sæpe annulato-notatis, superiore terete inferiore subbreviore compresso seu canaliculato; flore flavo; ovario ovato; pulvillis 20–25 villosis et fulvo-setosis versus superiorem ovarii partem congestis; sepalis tubi 13 lanceolatis seu interioribus obovatis acuminatis cuspidatisve; petalis sub-8 obovatis obtusis mucronatis; stigmatibus 8; seminibus majusculis late obtuseque undulato-marginatis. (Tab. LXXV, fig. 8.)

Sandy ridges in the bottom of the Rio Grande near El Paso, also on the Limpia, *Wright:* fl. in May.—A remarkably striking plant 2–3 feet high—with large, almost rounded, thinly compressed, often purplish joints, and very long nearly black spines—of which it would be very desirable to obtain living plants, as none of those sent home by Mr. Wright have survived. Joints 5–8 inches long, 4–7 inches wide; leaves 2½–3 lines long, remarkably slender; pulvilli ¾–1 inch apart; lower ones smaller and closer together, unarmed; spines on the upper ones 2–3 inches long, lower half almost black; ovary 1¼ inch long, 8 lines in diameter; flower 3 inches in diameter when fully open. The seeds sent by Mr. Wright as belonging to this species are 2.0–2.2 lines in diameter, much twisted, their border undulating, very similar to seeds of some form of *O. phæacantha*. From this species our plant seems to be distinguished by its larger, thinner, more orbicular joints, the closer and more woolly pulvilli, the slenderer leaves, and the small number of very long spines; the ovary also is more elongated, the sepals narrower, the flower larger.

5. O. PHÆACANTHA, E. in Pl. Fendl.: diffusa, adscendens; articulis obovatis seu suborbiculatis crassis glaucescentibus; foliis e basi crassa subulatis; pulvillis subremotis orbiculato-ovatis setas graciles stramineas seu fuscatas tomento griseo plerumque longiores gerentibus

plerisque armatis; aculeis 2–5 rectis superiore teretiusculo porrecto, cæteris brevioribus inæqualibus plus minus angulatis seu compressis deflexis fuscis seu fusco-atris sursum pallidioribus; flore flavo; ovario brevi pulvillis sub-20 tomentosis et fulvo-setosis versus superiorem ovarii partem congestis; sepalis tubi sub-13 exterioribus late oblanceolatis cæteris late obovatis cuspidatis; petalis 8–10 late obovatis obtusis submucronatis; stigmatibus 8 erectis; bacca cuneato-pyriformi late umbilicata vix pulposa; seminibus plerumque majusculis sub-regularibus crasse marginatis. (Tab. LXXV, fig. 9–13.)

Var. *α.* NIGRICANS: obovata, viridior; pulvillis magis approximatis; aculeis brevioribus acute angulatis nigricantibus.

Var. *β.* BRUNNEA: obovata, glaucescens; pulvillis remotis; aculeis longioribus obtuse angulatis infra brunneis.

Along the Rio Grande near Santa Fé, var. *α. Fendler;* var. *β.* common about El Paso, on the sandy ridges in the immediate valley of the river, *Wright.*—The northern plant has been correctly described in *Plantæ Fendlerianæ,* with the exception of the flower, which probably refers to *O. Missouriensis,* or some allied species. The variety from El Paso has remarkably thick and glaucous joints, which in fall and winter often assume a purplish hue; they are commonly 4 or 5 inches long, and 2½–3 inches wide; the largest ones were 7 inches long, and 4½ inches broad; sometimes they are more orbicular and shorter; leaves 2½–3 lines long, thick in proportion; pulvilli 1–1½ inch apart, with dirty yellowish or brownish bristles; only the lowest ones without spines; spines usually 2–4, sometimes 4 or 5, and even more, in one bunch, 1–2 or sometimes 2½ inches long, terete or more or less flattened, but without sharp angles, often striate, light or dark brown below, whitish above; lower spines often entirely whitish. Flower 2¼–2½ inches in diameter; ovary 10 lines long, 8 lines in diameter; fruit 1¼–1½ inch long, with the lower part contracted, solid and seedless; umbilicus rather shallow; seeds very variable, usually over 2 lines in diameter, but sometimes smaller.

6. O. TENUISPINA, (sp. nov.): diffusa seu adscendens; articulis mediis seu majusculis obovatis basi attenuatis læte viridibus; foliis gracilibus subulatis parvis, pulvillis subapproximatis setas breves graciles fulvas rufasve gerentibus, plerisque armatis seu inferioribus inermibus; aculeis singulis binisve teretiusculis rectis gracilibus flexilibus albidis non raro basi apiceque fuscatis annulatisque, adjectis sæpe inferioribus tenuioribus albis, superiore in areolis superioribus porrecto, cæteris deflexis; ovario clavato gracili pulvillis 25 versus apicem aggregatis griseo-villosis et fulvo-setosis stipato; sepalis tubi sub-13 obovato-orbiculatis abbreviatis cuspidatis; petalis 13 obovatis sub-emarginatis mucronulatis flavis basi aurantiacis; stigmatibus 7–8 erectis virescentibus; bacca minore oblonga profunde umbilicata, seminibus minoribus irregulariter angulatis anguste marginatis. (Tab. LXXV, fig. 14.)

Sand-hills on the Rio Grande, near El Paso, from Doña Ana to San Elizario, *Wright;* fl. May.—About a foot high, spreading; joints 3–6 inches long, 2–4 inches wide; leaves 2 lines long, or less, ½ line in diameter; pulvilli ½ inch, or, in the largest specimens, almost an inch apart, with short grey wool, and bright, reddish-brown, slender bristles, 1–1½ line long; spines stiff and very straight, but flexible; lowest ones ½–1¼ inch long; upper ones 1½–2½, or rarely even 3 inches long, whitish, or, in some species, brown towards the base, or on the lower half, always darkish at tip; flower 2½–3 inches in diameter; ovary 1–1¼ inch long, slender; sepals remarkably short; petals rounded or somewhat emarginate, 1–1¼ inch long, 6–9 lines broad, yellow, with orange-red at base, turning all red on the second day of flowering. Fruit 1–1¼ inch long, with a very deep umbilicus, and without any contraction at base; seeds 1.5–2.0 lines in diameter, deeply notched at the hilum, very irregular. Distinguished from the nearly allied *O. phœacantha* by its thinner joints, slenderer and longer spines, larger flowers, different fruit, &c.

7. O. FILIPENDULA, (sp. nov.): adscendens, glauca; radicibus nodoso-incrassatis tuberiferis; articulis minoribus diversissimis orbiculatis seu obovatis seu oblanceolatis tenuibus; foliis minutis subulatis; pulvillis approximatis in tomento albo setas numerosas tenuissimas penicillatas demum elongatas virescenti-stramineas gerentibus, plurimis armatis seu omnibus plus minus inermibus; aculeis 1–2 albidis elongatis setaceis non raro subangulatis tortisque, 1–2 minoribus sæpe adjectis; ovarii subcylindrici gracilis pulvillis 16–20 villo albo et setis parcis stramineis munitis; sepalis tubi sub-8 lanceolatis, interioribus obovato-cuspidatis; petalis 8 late obovatis retusis purpurascentibus margine pallidioribus; stylo purpurascente; stigmatibus 5 erectis flavidis; seminibus minoribus tumidis anguste crasseque marginatis. (Tab. LXVIII.)

Alluvial bottoms of the Rio Grande, in rather fertile soil, near Doña Ana, above El Paso, and at San Elizario, below it; also on alluvial prairies between El Paso and the Limpia, *Wright*: fl. May and June.—The tubers of the root, ½–1 inch thick, are long and cylindric, or oval, or globular swellings of the roots, strung upon thick fibres; these tubers will sprout when planted. The stems are 6–12 inches high and spreading; joints of a bluish glaucous hue, more so than any other of our species, very variable in shape, orbicular, or even transverse to obovate and lanceolate, often on the same plant, 1½–3 inches long, 1–2 inches wide, very much compressed; leaves 1¼–1¾ line long; pulvilli 4–6 lines apart, with a perfectly white tomentum, becoming grey when old, and numerous slender, greenish-yellow bristles, which finally become 2–3 lines long and very conspicuous. Sometimes the joints are entirely spineless, but usually they are armed with long, deflexed, very slender, white spines; the longer ones 1–2 inches, the lower and shorter ones less than 1 inch in length; ovary slenderer than in any other species known to me, an inch long, at top hardly more than 3 lines wide; flowers about 2½ inches in diameter, purplish, without any mixture of brick-red or yellow, as in the allied species. The only other purple one of our *Platopuntiæ* is *O. basilaris*, which is of a yet purer and deeper purple color. Fruit unknown; seeds have been sent which have germinated and produced plants which already after the first year showed the characteristic glaucous hue and the tuberous roots. These seeds also differ from all our other *Opuntia* seeds by their great thickness, and their remarkably narrow but thick and obtuse margin; they are only very slightly notched at the hilum, and have a diameter of 1.7–2.0 lines, with a thickness of 1.2 lines.

8. O. MACRORHIZA, E. in Pl. Lindh., from between San Antonio and Austin, *Lindheimer*, is apparently well distinguished by its large tuberous roots, which even the young seedlings very soon begin to show; but without these it is hardly distinguishable from *O. Rafinesquii*, E. of the Mississippi valley. I find the flower bud long-acuminate, and the stigmata always 5. (Tab. LXIX.)

9. O. RUFIDA (sp. nov.): erecto-patula; articulis late obovatis seu suborbiculatis pubescentibus; foliis e basi lata subulatis longe acuminatis; pulvillis confertis griseo-villosis setas rufidas graciles numerosissimas penicillatas gerentibus inermibus; floris flavi ovario obovato pulvillis 40–50 instructo; sepalis tubi 20–30 exterioribus lineari-lanceolatis acuminatis, interioribus obovatis cuspidatis; petalis (8?) orbiculato-obovatis obtusis erosis sæpe mucronulatis; stigmatibus sub-7 abbreviatis in capitulum globosum congestis.

Common about Presidio del Norte, on the Rio Grande, on rocks and mountains, *Bigelow*; in the lower valley of the Nazas, southeastern Chihuahua, *Gregg*: fl. May.—Stems 2–4 feet high; joints 2–6 inches long, pale green, without any red or colored spots surrounding the pulvillus, as is said to be constantly the case in the allied *O. puberula* and *O. decumbens*; leaves very slenderly acuminate, 2½ lines long, about twice the length of the axillary wool; pulvilli thickly tomentose, and with an abundance of very delicate brown-red bristles, almost entirely covering the surface of young or not fully-grown joints; in adult ones about 4 lines apart. The flower described above was obtained south of the Rio Grande, in the Bolson de Mapimi; ovary 10 lines long, flower 2½ inches in diameter, stigmata (green?) about one line in length. This species is nearly allied to *O. microdasys*, which is common in cultivation, and specimens of which from Saltillo I have been able to compare. Our plant has more rounded and larger joints, more distant pulvilli, which bear reddish-brown (not yellow) bristles, and longer leaves; from *O. puberula*, which seems to be yet nearer allied to it, it differs by the absence of spines, larger leaves, etc. Mr. Schott has noticed a pubescent *Opuntia* on the dividing ridge of the California Cordilleras, near the boundary line, and a suberect species in the Santa Cruz valley, in Sonora, about 3 feet high, both without spines. It is impossible to form any opinion where they belong, as no specimens have been saved.

10. O. BASILARIS, E. & B. in Pacif. R. R.: found by *Mr. Schott*, in the Gila valley, and up the eastern slope of the Californian Mountains; fl. in May.

11. O. ARENARIA (sp. nov.): diffusa, adscendens; radicibus crassis elongatis sæpe stoloniferis; articulis minoribus obovatis crassis tumidis seu subcompressis tuberculatis nitide virentibus; foliis minutis pulvillo vix longioribus; pulvillis subconfertis parce albo-tomentosis setas plurimas gracillimas pallidas demum in articulis vetustis numerosissimas pulvinatas fulvas gerentibus, omnibus fere armatis; aculeis superioribus 1–4 sæpe subangulatis, summo validiore porrecto albido seu fusco-variegato, cæteris brevioribus divergentibus seu deflexis albidis; aculeis inferioribus 2–6 brevibus setaceis albis radiantibus; floribus sulphureis; ovario obovato pulvillis 20–30 setosis aculeolatisque instructo; sepalis tubi 12–14, inferioribus late obovatis cuspidatis, superioribus obtusis; petalis sub-8 obcordatis seu emarginatis sæpe mucronatis; stigmatibus 5 mucronatis viridibus in capitulum collectis; bacca oblonga ovata; umbilico infundibuliformi aculeolis 3–6 inæqualibus deflexis armata; seminibus magnis irregularibus late crasseque marginatis. (Tab. LXXV, fig. 15.)

Sandy bottoms of the Rio Grande near El Paso, *Wright*: fl. May.—Roots 3–5 lines thick, at last ligneous, far spreading in the loose sand, and sometimes stoloniferous, which I have also noticed in some forms of *O. Missouriensis*; stems spreading 2 or 3 feet, ½–1 foot high; joints 1½–3 inches long, 1–2 inches wide, often terete or rather oval, or clavate, (a specimen before me is 2½ inches long and ¾ inch thick,) and always strongly tuberculate. Leaves about a line long; pulvilli smaller than in *O. fragilis*, very sparingly tomentose, very bristly; the tawny bristles of the old joints covering almost the whole surface. Upper and longer spines 9–15, or even 18 lines long, white, with a yellow tip, or brown, yellow, or reddish at base and tip; other spines 2–6 lines long, white. Flower 2–2½ inches in diameter; ovary 9–12 lines long; filaments greenish-yellow; stigmata nearly 2 lines in length. Fruit dry, 10–14 lines long, contracted at top, with a deeply immersed umbilicus, and with spines of 1–5 lines in length; seeds 2½–3 lines in diameter. This species is nearly allied to the northern *O. fragilis*, but is distinguished by the larger and more strongly tuberculated joints, smaller pulvilli set with numerous bristles, the longer and slenderer spines, and the spinose fruit.

Subgen. 3. CYLINDROPUNTIA.

Articuli teretes, clavati seu cylindrici. Aculei plerumque vaginati.

Flores parvi seu majores. Petala obovata seu orbiculata, rubra seu purpurea, rarius flava.

Stigmata 5–8, obtusa.

Bacca umbilicata, sicca seu subsicca, rarissime pulposa; inermis, seu setosa, seu aculeata; floris rudimentis dejectis seu persistentibus.

Semina sutura commissurali cincta, plerumque immarginata.

Embryo circa albumen copiosius subcircularis. Cotyledones contrariæ, incumbentes, haud raro obliquæ, interdum parallelæ, accumbentes.

The species forming this subgenus have an appearance so striking, and at the same time so distinct from the common type of *Opuntiœ*, that a generic separation has been attempted; but the flowers are so entirely identical, and in the fruit so little difference is observed, that it had to be abandoned; the only real distinction, and a permanent one, as far as my observation goes, I find in the embryo; in *Cylindropuntia* it is less curved, not completing an entire circle, and surrounds a more copious albumen; in *Platopuntia*, on the contrary, it is somewhat spirally coiled, and the space for the albumen is thereby much smaller. It is worthy of remark, that in *Cylindropuntia* the direction of the cotyledons is by far less constant than in other *Cactaceœ*; though usually incumbent, as in all other *Opuntiœ*, they are very often oblique, and not rarely accumbent, like to those of *Echinocactus;* in *O. echinocarpa* I have found them invariably so.

§. 1. *Clavatœ.*

Stems prostrate; joints short and clavate, tuberculate, proliferous near the base; the ligneous tissue loosely reticulated much like that of *Platopuntia;* spines more or less compressed and striate, the epidermis not or but slightly separating from them; flowers yellow and rather large; fruit always dry, crowned by the persistent remains of the flower, beset on the pulvilli with numberless spiny bristles.

12. O. PARRYI, E. in Sill. Journ. *Dr. Parry* observed this species on the eastern slope of the Californian Mountains near San Felipe, and sent notes about it, an extract of which I published in Silliman's Journal. Since then *Dr. Bigelow* has collected it 80 or 100 miles northeast of that place, near the Mojave river, and in his report a full account of the plant is given. Dr. Parry describes the joints as 4–8 inches long, ascending, with white spines only 6 lines long; flowers greenish yellow, 1½ inch in diameter; stigmata green.

13. O. EMORYI, (sp. nov.): prostrata; articulis cylindricis basi clavatis glaucis adscendentibus; tuberculis elongatis; pulvillis magnis setas paucas rigidas gerentibus; aculeis plurimis rufis seu fuscis demum cinerascentibus; interioribus 5–9 validioribus triangulatis subcompressis porrectis seu deflexis, superioribus solum suberectis; aculeis exterioribus 10–20 sæpe pluriserialibus undique radiantibus, superioribus gracilioribus teretiusculis, inferioribus rigidioribus compressis; floribus flavis extus rubellis; bacca ovata basi clavata flava pulvillis 35–50 stipata setosissimis, omnibus seu solum inferioribus aculeatis; seminibus numerosissimis valde inæqualibus plerumque transversis indistincte commissuratis. (Tab. LXX—LXXI.)

Arid soil south and west of El Paso, especially between the Sand hills and Lake Santa Maria, *Wright*, *Bigelow*, in Sonora, *Wright*, and on the lower Gila and in the Colorado desert, *Schott:* fl. August and September.—This is the largest and stoutest of our clavate *Opuntiœ*, with very numerous and long spines, spreading largely and growing 6–12 inches high; forming a welcome retreat for the smaller Rodentia, snakes, &c., which, under the protection of its powerful spines, are secure against the attacks of their enemies. Joints curved, 4–6 inches long, 1–1½ inch in diameter; the tubercles are 1–1½ inch long, very prominent, and might be termed cylindric if they were not longitudinally attached to the stems. The upper tubercles of each joint and their spines are more fully developed than the others in this, as in all *Opuntiæ.* In those we distinguish four larger central spines; the upper one more erect, the lower one stouter, longer, broader, and deflexed. We often find a second upper one above, and a second lower one below the other, or the four central spines are surrounded by a circle of 6 or 8 somewhat smaller spines, which may be considered as an interior series of radiating ones. The exterior series consists of 10–20 shorter and more slender spines; but the arrangement of spines in this genus is never so regular as it is in other genera, especially in *Echinocactus.* Stoutest spines 1½–2½ inches in length, ¾–1 line wide, striated, flat on the upper, strongly carinate on the lower surface, so as to appear triangular; other interior spines 1-2 inches, exterior ones ¾–1½ inch long. Fruit 2–2½ inches long, an inch in diameter; larger pulvillis 2–2½ lines in diameter; bristles whitish or reddish 3–4 lines long; 10 or 12 spines, 4–8 lines in length, are mixed with the bristles on all or only on the lower pulvilli. Seeds in the same fruit 2½–3 lines in diameter, or more; often transverse, or angular, blunt or beaked; cotyledons generally oblique, sometimes accumbent, contrary to the usual arrangement in this genus. The specimens from the lower Gila and the Colorado must, I have little doubt, also be referred here. Plant 12–18 inches high, far-spreading, of a dull greyish-green color; joints similar to those described above; spines only 1–1½ inch long; flowers sulphur-yellow, externally tinged with purple, 2 or 2½ inches in diameter; pulvilli of the ovary over a line in diameter, white-tomentose, supported by subulate leaves (2 lines long), bearing short white bristles and reddish spines; exterior sepals oblanceolate, cuspidate, red-brown; interior ones with yellow and red petaloid margins; petals yellow, with red tips; fruit not as large, but even more spiny than in the specimens from El Paso. This species, also, has been named in honor of *Col. Wm. H. Emory*, who, in his different expeditions to the extreme southwestern parts of our territory, always exerted himself for the advancement of our knowledge of the natural history of these regions.

14. O. Schottii (sp. nov.): articulis breviter clavatis adscendentibus; tuberculis elongatis; pulvillis paucisetosis; aculeis scaberrimis rubellis, interioribus 4 cruciatis, superiore triangulato erecto, cæteris ancipitibus supra planis subtus convexis, inferiore latiore; aculeis exterioribus 8–10 radiantibus valde inæqualibus; bacca ovata clavata pulvillis 35–40 setas suberectas aculeosque paucos gerentibus; seminibus angulatis rostratis transversis, commissura lineari indistincta. (Tab. LXXIII, fig. 1–3.)

Abundant on the arid hills near the Rio Grande, between the San Pedro and Pecos rivers, *Wright, Schott.*—The specimens gathered in July and September were all in fruit. Joints 2 inches, tubercles 8–9 lines long; pulvilli even in the oldest joints with few bristles; spines rougher than in any other allied species, red; the broader ones with a white margin, 1½–2 inches long; smaller radiating spines 4–9 lines long, almost surrounding the inner one. Ovary with white-tomentose pulvilli and short bristles; those in the fruit become a little longer, but are confined to the upper half of the pulvillus and are erect, while in all the allied species they are much more numerous and stellately spread in all directions. Seed a little over 2 lines in the transverse diameter; cotyledons in all the seeds examined oblique. Dedicated to one of its discoverers, whose name I have often had occasion to mention.

Dr. Gregg has sent a similar plant from San Luis Potosi, Mexico, which, though growing 7 or 8 degrees farther south, I must consider the same as *O. Schottii.* Its joints 2 inches long; tubercles 10–12 lines long; 4 central spines ancipital or triangular, 12–20 lines long, much less rough, 8–12 exterior spines of very different sizes. (Tab. LXXIII, fig. 4.)

15. O. GRAHAMI (sp. nov.): radicibus crassis fusiformibus; articulis breviter clavatis adscendentibus læte viridibus; tuberculis oblongis; folii e basi ovata abrupte acuminatis; pulvillis albo-tomentosis setas demum numerosas elongatas rigidas gerentibus; aculeis gracilibus scabris rubellis demum cinereo-fuscis, interioribus 4–7 robustioribus scabris teretiusculis seu 4-angulatis seu rarius compressis, exterioribus 4–6 multo minoribus; flore flavo; ovarii pulvillis sub 30 albo-tomentosis setosis; bacca ovata setosissima; seminibus regularibus vix rostratis, commissura lineari indistincta. (Tab. LXXII.)

Sandy soil in the bottom of the Rio Grande, near El Paso, and for a distance of about 100 miles along the river, *Wright*, *Bigelow;* fl. June.—Roots often 6 inches long and an inch thick, tapering, single or divided; joints 1½–2 inches long, ¾ or at most 1 inch in diameter; tubercles 6–7 lines long; leaves similar to those of *O. vulgaris*, short and thick; nearly a line in diameter at base and about twice as long. Larger spines 1½–2 inches long and spreading, scabrous, slenderer than in any allied species. Flowers apparently 2 inches in diameter, and, like the fruit, very similar to those of *O. clavata;* seeds 2.5–2.8 lines long, with a linear and often very indistinct commissure; cotyledons in the seeds examined regularly incumbent. This species, peculiar to an interesting part of our boundary, has been named in honor of the gentleman who was for a time chief of the scientific corps of the Commission, and by whose orders this, with many other species of *Cacti*, has been sent to me.

16. O. BULBISPINA (sp. nov.): radicibus fusiformibus; articulis parvis ovatis vix clavatis sæpius ex apice proliferis fragilibus; pulvillis parce setosis, junioribus laxe villosis; aculeis teretiusculis scabrellis basi bulbosis, interioribus 4 cruciatis, inferiore longiore, exterioribus 8–12 radiantibus. (Tab. LXXIII, fig. 5–6.)

Near Perros Bravos, north of Saltillo, *Gregg.*—Spreading masses 2–4 feet in diameter; joints 9–12 lines long, 6 lines in diameter, often proliferous at the upper end; tubercles 3–4 lines long; interior spines 4–6 lines, exterior ones 1½–3 lines in length. This species has the subcylindric joints, the reticulated ligneous texture, and the scabrous spines of the clavate *Opuntiæ*, but its mode of ramification is rather different, and the form of the joints is more ovate than clavate. Perhaps it belongs rather to Prince Salm's section *Glomeratæ*, and near *O. pusilla* from South America.

§ 2. *Cylindricæ.*

Stems ascending or usually erect, much branched; joints cylindric or tumid, tuberculate or sometimes almost smooth; the ligneous tissue is compact, and either (in spec. 17–24) forms a reticulated hollow tube, in which the meshes correspond with the tubercles, and which by age becomes more and more solid and massive, or it is (in spec. 25–28) reticulated only when quite young, and soon becomes quite dense. The spines are almost always terete, and are always covered with a loose glistening sheath. Flowers purple or rarely yellow, large, or usually middle sized or (in the two last species) quite small. The fruit is unarmed, somewhat fleshy or leathery, rarely pulpy, throwing off the dead flower, or very rarely retaining it. In a few species it is dry and spiny.

17 O. ECHINOCARPA, E. & B. in Pacif. R. R. Var. β. MAJOR: elatior; articulis elongatis basi attenuatis; tuberculis oblongo-linearibus; setis tenuibus penicillatis; aculeis longioribus laxius vaginatis paucioribus; bacca globosa seu basi clavata pulvillos pauciores gerente.

In the deserts on both sides of the Colorado, and in Sonora, *Schott.*—This form looks very different from the plant collected by Dr. Bigelow, and described in the report of Captain Whipple; but the very peculiar seeds which fortunately have been obtained by both collectors prove them to be identical. Dr. Bigelow's plant is a low straggling shrub; but Mr. Schott's is 4 or 5 feet high, with divaricate branches, joints 8–10 inches long, with elongated tubercles, (6–9 lines in length,) fine long bristles, and longer spines with looser sheaths. The 4 central larger spines are 1–1¾ inch long; the 4–8 radiating spines on the contrary shorter; the first is longer and bears only about 25 pulvilli, as spiny as in the original form.

18. O. SERPENTINA, E. in Sill. Journ., 1852: diffusa; ramis elongatis subverticillatis divaricatis adscendentibus; tuberculis prominentibus ovatis; pulvillis albido-setosis; aculeis 7–9 vaginatis albidis seu rufescentibus porrectis, infimis deflexis; floribus minoribus flavis extus rubellis; ovario depresso pulvillis sub-20 stipato; sepalis 10 late obovatis breviter cuspidatis; petalis sub-5 obovatis integriusculis mucronatis; stigmatibus 8 erectis; bacca sicca subhemisphærica villosa aculeatissima late et profunde umbilicata flore emarcido sæpe coronata.

Dry hills near San Diego, California, *Parry*, generally nearer the seacoast than *O. prolifera*, and not gregarious, nor so common as that species, *Schott.*—Stems 1–1½ inch in diameter, suberect, 4–5 feet high, or almost prostrate; joints 6–12 inches long, ¾–1¼ inch thick, somewhat verticillate, divaricate; spines 3–9 inches long, sheathed, light yellowish, or rusty, upper ones stellate-divaricate, lower one closely deflexed. A single flower was collected by Mr. Schott in October; it is not quite 1½ inch wide, the ovary depressed, about 8 lines high with 20 areolæ bearing dirty yellowish wool, yellow bristles, and 5–7 reddish brown sheathed spines, 2–4 lines in length; sepals externally yellowish-green, tinged with purple; even the lower ones unusually obtuse or short cuspidate; petals rounded scarcely 9 lines long, yellow above, red at tip, ascending and forming a cup-shaped corolla; stigmata (green ?) 2 lines long. Fruit saucer-shaped, deeply and broadly umbilicate, yellowish-brown, very spiny, and "long woolly."

19. O. PROLIFERA, E. l. c.: caule arborescente; ramis numerosis horizontalibus divaricatissimis; articulis ovatis seu ovato-cylindricis tumidis fragilibus versus ramorum apicem congestis perviridibus, inferioribus demum refractis brunneis; tuberculis obovato-oblongis prominulis; pulvillis ovatis tomentosis, vetustioribus stramineo-setosis; aculeis 8–10 obscuris stramineo seu rufo-vaginatis, singulo subcentrali, cæteris patulis stellatis, inferioribus brevioribus; flore rubro; sepalis late ovatis; petalis oblongo-obovatis; stigmatibus erectis; bacca ovata umbilicata aculeolata sæpissime sterili proliferaque.

On arid hills about San Diego, California, near dry beds of streams, forming impassable and extensive thickets, *Parry*, *Schott.*—These thickets are likened by Mr. Schott to unapproachable coral reefs. Stem 2–4 and sometimes even 6–7 inches thick, and 3–10 feet high; the wood forms a reticulated hollow tube with short meshes, which in old plants finally become obliterated. The tumid joints are 3–6 inches long, 1½–2 inches in diameter, clustered at the end of the branches; the younger ones easily break off and stick to the skin of men or animals. The tubercles are obovate, narrowed below, and about 6 lines in length, arranged in 5 or 8 spirals; areolæ oval, somewhat immersed, with bunches of fine straw-colored bristles at the upper edge. Spines very variable, always with large loose sheaths; in a specimen before me I find 7–8 radiating spines; the upper ones and the central one equal, about 12–14 lines long; the lower ones 6–8 lines long, with a few still smaller ones below; in other specimens the upper spines are reduced in size or are wanting; flowers dark-red, salverform, about 1½ inch in diameter; fruit said to be spinulose, but always abortive, as Dr. Parry has often satisfied himself, and usually proliferous. This species somewhat resembles *O. arborescens*, but is easily distinguished by the short and tumid joints, short tubercles, spiny fruit, etc. The alliance with the next species and with *O. Bigelovii* is much closer. They represent the same type east of the California mountains that this does on the Pacific coast; just as *O. echinocarpa* in the Colorado valley represents another type which has on the coast its representative in *O. serpentina*.

20. O. FULGIDA (sp. nov.): caule erecto arborescente flexuoso; ramis numerosis divaricatis; articulis ovatis seu ovato-cylindricis tumidis glaucescentibus ad ramorum apicem congestis; tuberculis ovato-oblongis sub-prominulis; foliis ovatis cuspidatis; pulvillis pulvinatis ovatis tomentosis setas pallide stramineas et aculeos 7–9 subæquales laxe vaginatos undique porrectos stellatos gerentibus; floris parvi purpurei ovario ovato pulvillis 25–30 albo-tomentosis prædito setis aculeisque destituto; sepalis tubi 8–10 orbiculatis obtusis crenulatis; petalis 8, exterioribus cuneatis retusis crenulatis, intimis lanceolatis acutis cætera superantibus; stigmatibus 5 erectis; bacca ovata pulposa vix tuberculata plane umbilicata sæpissime sterili et fasciculatim prolifera; seminibus parvis irregulariter angulatis rostratis anguste commissuratis; cotyledonibus regulariter incumbentibus. (Tab. LXXV, fig. 18.)

Throughout all the Sierras in western Sonora, named by the inhabitants "Vela de Cojote," whence the specific name, which however would be just as appropriate for most other cylindric *Opuntiæ*, which are often visible for several miles when the sun strikes the glistening sheaths of their spines: fl. in July and August.—Stems 5–12 feet high, flexuous with few divaricate branches; joints clustered at their ends, 3–8 inches long and often 2 inches in diameter; "dull grayish, inclined to olive"; tubercles ovate-elongate, 6–7 lines long; leaves thick and only about 1 line long; spines almost equal in length, (1–1¼ inch,) stellate and not much deflexed; completely hiding the surface of the young joints; ovary about 10 lines long; flower cup-shaped, mostly less than an inch in diameter; fruit a plump fleshy berry, oval, rounded, not or only slightly tuberculated, 1–1¼ inch long, a little less in diameter, and entirely spineless; characterized by the large white tomentose pulvilli. Seeds 1–1½ line in diameter, or with the beak often 2 lines long, much compressed, and thin and very angular, often oddly shaped. The fruit is not rarely sterile and proliferous, and becomes pendulous from the weight of the young sprouts attached to it.

21. O. WHIPPLEI, E. & B. in Pacif. R. Rep., var. β SPINOSIOR: elatior, erecta; articulis cylindricis; tuberculis ovatis confertis; pulvillis parce tomentosis, vix setosis; aculeis 12–14 stramineo-vaginatis stellato-porrectis; flore rubro; ovarii ovati tuberculati pulvillis 20–30 albo-tomentosis setas stramineas et aculeolos paucos mox deciduos gerentibus; sepalis 8 orbiculatis cuspidatis; petalis 8–10 spathulatis cuspidatis; bacca subglobosa leviter tuberculata inermi; seminum commissura lineari.

From the Gila south to the Santa Cruz river and Tucson, and further east, *Schott:* fl. in June.

—Stems 6–10 feet high; joints 4–12 inches long, ½–¾ inch thick, covered with ovate or rather rhombic tubercles. Spines much more numerous in this variety than in the original form, found by Dr. Bigelow farther north, 6–9 lines long. Flowers 1¼–1½ inch wide, cup-shaped; seeds nearly 2 lines in diameter, larger than in the northern form, with a very sharply marked linear commissure.

22. O. ARBORESCENS, E. in Wisl. Rep.: caule arborescente erecto reticulato-lignoso; ramis verticillatis horizontaliter divergentibus seu pendulis; articulis verticillatis plerumque ternis quaternisve cylindricis perviridibus; tuberculis elongatis cristatis; foliis teretibus elongatis patulis; pulvillis ovatis pulvinatis breviter tomentosis vix setosis; aculeis 8–30 corneis seu fuscis stramineo-vaginatis undique stellato-porrectis, 1–8 interioribus longioribus laxius vaginatis, centrali sub-deflexo, exterioribus debilioribus arcte vaginatis; flore purpureo magno; ovarii subglobosi tuberculati pulvillis 20–25 breviter tomentosis setas minutas et aculeolos paucos erectos deciduos gerentibus; sepalis tubi 8–13 obovatis obtusis medio virescentibus margine purpureis; petalis 1012 obovatis obtusis retusisve; filamentis purpureis; stigmatibus 8; bacca globosa seu hemisphærica tuberculis prominentibus cristata late umbilicata inermi subsicca flava; seminibus regularibus anguste commissuratis; cotyledonibus incumbentibus seu rare obliquis. (Tab. LXXV, fig. 16–17.)

This species extends from the upper waters of the Arkansas and the Platte rivers deep into Mexico, and from the plains east of the Llano Estacado (200 miles east of the Pecos) to Zuñi, 150 miles west of the Rio Grande, about 15 degrees of latitude and 8 of longitude: fl. May and June.—North and east this species is only about 5 feet high, but further south it is said to become 20 or 30 feet high. Even the old trunks continue greenish and spiny; the massive ligneous skeleton is always characterized by the elongated-rhombic meshes and the verticillate insertions of the branches; in very old specimens the cavity of the tube and the meshes become almost obliterated by the filling in of ligneous layers. The roots are often somewhat tuberous by a swelling of the fibres. Joints 2–6 inches long, less than an inch in diameter; tubercles compressed-cristate, elevated, 7–9 lines long; leaves 6–10 lines long, hardly a line in diameter; spines very variable in number and size; sometimes we find only 8–12 spines, not half an inch long, so that the plant from a distance appears spineless; but more frequently 20–25, or even more spines occur, the longest middle ones deflexed, and 8–10, or rarely 12–14 lines in length, other spines spreading all around, 4–8 lines long. The beautiful purple flowers are 2½–3 inches in diameter, and often profusely cover the tree; the stigmata have a length of 3 or 3½ lines. The fruit is about an inch long in all dimensions; umbilicus wider or narrower, shallower or deeper, according to the greater or smaller prominence of the upper tubercles of the fruit. Seeds 1½–2 lines in diameter, usually of a regular shape, with little or no beak; the commissure distinct, and between 0.1 and 0.2 line broad; cotyledons almost always regularly incumbent, rarely somewhat oblique. Sometimes 3 cotyledons are observed in the seeds of this species, as is also the case in many others.

23. O. MAMILLATA, A. Schott in litt.: caule arborescente reticulato-lignoso divaricato-ramosissimo; articulis ovato-cylindricis crassis abbreviatis retusis perviridibus; tuberculis ovatis tumidis prominentibus; foliis ovatis abbreviatis cuspidatis; pulvillis ovatis albo-tomentosis setas brevissimas seu nullas gerentibus; aculeis 4–6 gracilibus brevibus arcte vaginatis stramineis, plerisque deflexis; flore parvo purpureo; ovarii ovati pulvillis 18–24 pulvinatis albo-tomentosis; sepalis tubi sub-8 orbiculatis; petalis 8 late obovatis abbreviatis; filamentis exterioribus

dilatatis (sterilibus?); stigmatibus 7–8 erectis; bacca ovata plane umbilicata pulvillis magnis albo-tomentosis inermibus notata; seminibus parvis angulatis vix rostratis anguste commissuratis valde compressis. (Tab. LXXV, fig. 19.)

South range of the Sierra Bubuquibari, in Sonora, and southeastward, in fertile valleys, *Schott:* fl. July and August.—This peculiar species is more tree-like than any other Sonorian *Opuntia.* It has a distinct trunk and a dense top, much like any other ordinary tree, though only 5 or 6 feet high; the joints are 3 or 4 inches long, and 1½ inch in diameter; the swelling tubercles much resemble those of a *Mamillaria,* whence the name; the thick leaves are scarcely a line long; spines few, 3–9 lines long, sometimes almost wanting. The flowers are hardly an inch in diameter, and of a bright pink or purple color; the ovary is 8 or 9 lines long, and the fruit of the same length, slightly tuberculate, in all the specimens before me unarmed, (according to Mr. Schott's notes, "spiny.") Seeds 1–1½ line in each dimension, often higher than broad, very irregular, remarkably similar to those of *O. fulgida,* but scarcely beaked, and still more compressed; cotyledons incumbent, or often somewhat oblique.

24. O. Thurberi (sp. nov.): frutescens, erecta; articulis cylindricis gracilioribus tuberculatis; tuberculis oblongo-linearibus minus prominulis; pulvillis sub-orbiculatis breviter fulvo-tomentosis vix setosis; aculeis 3–5 brevibus obscuris stramineo-seu fulvo-vaginatis lateraliter divergentibus, infimo robustiore deflexo; flore miniato; ovarii clavati tuberculati pulvillis 18–20 tomentosis brevissime setosis et parce aculeolatis; sepalis tubi obovatis cuspidatis; petalis erectiusculis obovato-spathulatis obtusis retusisve; stigmatibus 7 brevibus crassis erectis.

Near Bacuachi, Sonora, *G. Thurber:* fl. in June.—Similar in some respects to *O. arborescens;* but the slender joints only about 6 lines in diameter; tubercles 9 lines long, spines 3–8 lines long, the lowest one the stoutest! and deflexed. The ovary is about 10 lines long and bears on some of the pulvilli 1 or 2 spines, which are evidently deciduous, as we see them in *O. arborescens* and *O. Whipplei;* the flower is 1½ inch in diameter, dull brick red, salver form, and opens much less than that of *O. arborescens,* which is pure purple; stigmata 1–1½ line long. This species I have named for its discoverer, Mr. George Thurber, who, in Mr. Commissioner Bartlett's party, traversed Sonora, and gathered many interesting plants in that then almost unknown country.

25. O. Wrightii (sp. nov.): caule frutescente erecto, juniore reticulate, seniore compacto-lignoso; ramis adscendentibus; articulis cylindricis gracilibus sub-tuberculatis; tuberculis elongatis depressis; foliis elongatis subulatis patulis; pulvillis orbiculatis albo-tomentosis setas gracillimas penicillatas gerentibus; aculeis singulis (seu rarius 1–2 superioribus minoribus adjectis) porrectis seu paullo deflexis e cinereo rubellis vagina straminea decidua indusiatis; flore miniato; ovarii obovati pulvillis 15–18 albo-tomentosis setosisque; sepalis tubi 9–12 orbiculatis, exterioribus cuspidatis, interioribus obtusis; petalis sub-8 late obovatis emarginatis; styli crassi stigmatibus 6–7 brevibus adpressis.

Common on steep rocky mountain sides on the Limpia, *Wright,* and along the Rio Grande from Presidio del Norte to the Pecos, *Parry, Bigelow;* also southward, in Mexico, *Gregg:* fl. June and July.—A shrub, 2–4 feet high, about 1 or 1½ inch thick below, intermediate between *O. arborescens* and *O. frutescens* in size, structure of stem, and arrangement of spines; branches few; joints 4 lines in diameter; tubercles flat, 7–9 lines long; leaves about 5 lines long; spines 8–10 lines in length, generally single or with 1 or 2 small and divergent ones above; in one specimen before me those upper spines are almost as stout and long as the lower one; flowers about 1 or 1¼ inch in diameter; ovary 7–8 lines long; fruit unknown.—This pretty species of *Opuntia* bears a name which has been often mentioned in these pages, and which is forever inseparably connected with the botany of our Southern boundary.

26. O. ARBUSCULA, (sp. nov.): caule erecto arborescente dense lignoso apice ramosissimo capitato; ramis divaricatis elongatis teretibus etuberculatis; articulis junioribus læte viridibus leviter tuberculatis; tuberculis oblongo-linearibus depressis; pulvillis magnis orbiculatis albo-tomentosis; setis parcis gracillimis penicillatis; aculeis singulis (seu subinde binis lateralibus) porrectis demum deflexis stramineo- seu fulvo-vaginatis, rarius une alterove breviore inferiore deflexo adjecto; flore flavo-virescente; ovarii clavati pulvillis 16–18 albo-tomentosis vix setosis; sepalis tubi sub-8 orbiculatis cuspidatis seu mucronatis; petalis sub-5 spathulatis, staminibus extus in staminodia latiora subulata transeuntibus; stigmatibus 5 brevibus erectis.

On the desert heights, near Maricopa village, on the Gila, *Schott*: fl. in June.—A truly arborescent species, 7–8 feet high, with a solid, ligneous trunk, 4–5 inches thick, smooth green bark, and a top formed by the numerous slender and divaricate branches; ultimate joints 2–3 inches long, about 4 lines in diameter; tubercles flat and indistinct, about 6 lines long; spine 9–12 lines long. Ovary, in my specimen, 10 lines long and only 4 lines in diameter, without any spines; but the fruit is described by Mr. Schott as "bristly, crowned by the persistent flower." Flower apparently nearly 1½ inch in diameter; petals few, 9 lines long and 4 lines broad, greenish-yellow, tinged with red. Stamina and staminodia (perhaps what I consider so are but the broader filaments of the exterior fertile stamens) finally breaking off near their base, leaving a rough surface. The name of this species indicates a small tree.

27. O. FRUTESCENS, E. in Pl. Lindh. was collected abundantly in all western Texas and southern New Mexico. For a fuller account and a figure, see Engelmann and Bigelow's paper on the *Cactaceæ* of Captain Whipple's Pacific Railroad Exploring Expedition Report.

28. O. TESSELLATA, E. in Pacif. R. R. (O. ramosissima, *E. in Sill. Journ.* 1852).—This curious species was first noticed by *Dr. Parry*, and described, as above cited, in an account of his Californian *Cactaceæ*, under the name of *O. ramosissima*, which being deemed an improper name in a section where all could claim it with equal, and some with greater justice, it was changed in the account of *Dr. Bigelow's* plants, who brought specimens of the wood, the branches, and the fruit. Mr. Schott, the third botanist who collected it, was fortunate enough to find the flowers. Living plants are yet a desideratum in our gardens.

This species grows in arid sandy soil, from the Sierra Madre south of the Gila to the lower Colorado, Bill Williams's fork, and the Californian Mountains. Mr. Schott found it in September with flower and ripe fruit. The flower is purple, about 6 lines in diameter; the clavate ovary is of the same length, and bears 40 or 50 very tomentose but scarcely spiny or bristly pulvilli; the 5 petals are almost orbicular; the exterior filaments are broad and persistent (sterile staminodia?); 5 stigmata short and erect. The fruit resembles very much those of the clavate *Opuntiæ;* it is 9 or 10 lines long, dry, ovate, and contracted above; the narrow and deep umbilicus contains the remains of the flower, the above-mentioned broad filaments being most conspicuous; externally it is covered with a profusion of hair-like flexuous bristles of a red-brown color, 2–3 lines in length, mixed with dense wool. Seeds thick, with a broad spongy commissure, 1.8–2.0 lines in diameter. Mr. Schott collected in May other greenish-yellow flowers, from similar bushes, which he considers as of a distinct variety; the ovary in these flowers appears elongated, and is probably sterile, and would have become persistent and proliferous, as we find it in many other *Opuntiæ;* so that this green-flowered form probably is not a variety of our species, but a degeneration.

ALPHABETICAL INDEX.

Page.

- Anhalonium, 17
- *Aulacothecæ*, 10
- *Cactus, bicolor*, 21
  - *viviparus*, 15
- CEREUS, 28
  - Berlandieri, 38
  - cæspitosus, 32
  - chloranthus, 29
  - ctenoides, 31
  - dasyacanthus, 30
  - dubius, 36
  - Emoryi, 40
  - Engelmanni, 36
  - enneacanthus, 34
  - Fendleri, 33
    - var. *pauperculus*, 34
  - giganteus, 42
  - Greggii, 40
    - α cismontanus, 41
    - β transmontanus, 41
  - longisetus, 32
  - paucispinus, 37
  - *pectinatus*, 31
    - var. rigidissimus, 31
  - *phœniceus*, 37
  - polyacanthus, 37
  - procumbens, 38
  - *Roemeri*, 38
  - Roetteri, 33
  - Schottii, 44
  - stramineus, 35
  - Thurberi, 44
  - tuberosus, 39
  - variabilis, 40
  - viridiflorus, 28
    - β cylindricus, 28
- *Clavatæ*, 53
- Coryphantha, 10
- *Cylindriceæ*, 55
- Cylindropuntia, 53
- ECHINOCACTUS, 18
  - *bicolor*, 27
    - var. Schottii, 27
  - brevihamatus, 19
  - cylindraceus, 25
  - Emoryi, 23
  - flexispinus, 21

Page.

- EOHINOCACTUS, hamatocanthus, 22
  - *horizonthalonius*, 26
    - var. centrispinus, 26
    - *var. curvispinus*, 27
  - intertextus, 27
    - var. dasyacanthus, 28
  - Le Contei, 23
  - longehamatus, 22
    - α crassispinus, 22
    - β gracilispinus, 22
    - γ brevispinus, 22
  - Parryi, 25
  - polycephalus, 25
  - Scheerii, 18
  - setispinus, 21, 22
    - γ *sinuatus*, 21
    - δ *robustus*, 22
  - sinuatus, 21
  - Texensis, 27
  - *uncinatus*, 20
    - var. Wrightii, 20
  - viridescens, 24
  - Wislizeni, 23
- Echinocereus, 28
- Eucereus, 40
- Eumamillaria, 31
- Lepidocereus, 42
- MAMILLARIA, 3
  - *applanata*, 8
  - *barbata*, in expl. of plates, 2
  - calcarata, 14
  - compacta, 12
  - *cornifera*, 14
  - *dactylothele*, 17
  - dasyacantha, 15
  - Echinus, 13
  - fissurata, 17
  - Grahami, 7
  - Goodrichii, 8
  - *gummifera*, 8
  - *hemisphærica*, 8
  - Heyderi, 8
    - applanata, 8
    - hemisphærica, 8
  - lasiacantha, 5
    - α minor, 5
    - β denudata, 5

Page.
MAMILLARIA, macromeris 16
meiacantha 9
micromeris 3
β Greggii 4
microthele 5
Nuttallii 10
β cæspitosa 10
ancistroides 7
pectinata 12
phellosperma 6
pusilla, β Texana 5
radiosa 15
α borealis 16
β Neomexicana 16
γ Texana 16
recurvispina 12
robustispina 11
Scheerii 11
β(?) valida 10
Schiedeana 5
scolymoides 14
similis 10
sphærica 9
tetrancistra 6
tuberculata 7
tuberculosa 14
vivipara 15
β radiosa 15
Wrightii 7
Melocactus laciniatus 27
OPUNTIA 45
arborescens 58
arbuscula 60
arenaria 52
basilaris 52
Bigelovii 84
bulbispina 55
chlorotica 71
decumbens 52
dulcis 48

Page.
OPUNTIA, echinocarpa, var. major 56
Emoryi 53
Engelmanni 47
filipendula 51
fragilis 52
frutescens 60
fulgida 57
Grahami 55
grandis 46
imbricata, in expl. of plates 6
macrocentra 49
macrorhiza 51
mamillata 58
microdasys 52
occidentalis 49
Parryi 53
phæacantha 49
var. α brunnea 50
var. β nigricans 50
prolifera 56
puberula 52
Rafinesquii 51
ramosissima 60
rufida 51
Schottii 54
var. Greggii 55
serpentina 56
stenopetala 46
Strigil 47
tenuispina 50
tessellata 60
Thurberi 59
tortispina 49
Whipplei, var. spinosior 57
Wrightii 59
PILOCEREUS 44
PLATOPUNTIA 47
Pubescentes 47
STENOPUNTIA 45
Xerocarpeæ 47

EXPLANATION OF PLATES.

Remarks.—All the figures are in natural size unless otherwise stated. The seeds of Mamillariæ, Echinocacti, and Cerei are represented in the natural size, and eight times magnified: *a* is a lateral view, natural size; *b*, same, eight times magnified; *c*, part of the surface of the seed still more magnified; *d*, seed after the removal of the outer coat, with endopleura and albumen; *e*, embryo; *f*, another form of same seed; *g*, seedling plant; *h*, back view; *i*, front view; *k*, basal view; *l*, top view of embryo—all eight times magnified.

The seeds of Opuntiæ, being larger, are represented: *a*, side view, natural size; *b*, same, four times magnified, as are all the following ones; *c*, posterior view; *d*, anterior view; *e*, vertical section; *f*, seed after the removal of the testa; *g*, embryo.

The landscape opposite the title-page represents a region near the Colorado river, with several *Cacti*, especially *Cereus giganteus;* one of them decayed, showing the form of the ligneous skeleton. The different plants are accurate copies of nature.

Pl. 1. Mamillaria micromeris: 1, a young plant not yet blooming, without the tuft; 2, a plant in bloom, with the tuft; 3 and 4, different views of a plant of the largest size; several fruits are seen in the tuft; 5, a tubercle with a bunch of spines, eight times magnified; 6, a bunch of spines in natural size, and 7 the same, eight times enlarged.

Pl. 2. *The same:* 1, lateral view of a bunch of spines, and its wool on the flower-bearing part of the plant, eight times magnified, exhibiting the upper elongated clavate spines; 2, flower, four times enlarged; 3, fruit; 4, seed.

Fig. 5–8. Mamillaria micromeris var. Greggii: 5, bunch of spines; 6, same, eight times magnified, showing the ragged ends of the long spines where they are broken off; 7, a bunch of spines, with its wool from the flowering part of the plant, with the long clavate spines, eight times magnified; 8, seed.

Pl. 3. Mamillaria lasiacantha: 1, a plant of the ordinary size in flower; 2, flower, four times magnified; 3, a tubercle with a bunch of spines, showing the pubescence, eight times magnified; 4–5, bunches of spines, natural size, and eight times magnified.

Pl. 4. Mamillaria lasiacantha var. denudata: 1, a fruit-bearing plant; 2, a tubercle, with its bunch of spines, eight times magnified; 3–4, bunches of spines, in natural size, and the same eight times magnified; 5, seed.

Pl. 5. Mamillaria pusilla var. Texana: 1, whole plant in flower; 2, a tubercle, with a bunch of spines and the axillary wool, twice magnified; 3, a bunch of spines, same; 4, flower, same; 5, fruit natural size; 6, seed.

Pl. 6, Fig. 1–8. Mamillaria Grahami: 1, a single plant; 2–4, bunches of spines, with one, two, and three central spines; 5, a tubercle and bunch of spines, magnified twice; 6, a bunch of spines from Dr. Parry's specimen from the Colorado, also magnified twice; 7, a flower from A. Schott's specimen from the Gila; 8 seed.

Fig. 9–12. Mamillaria barbata: 9, a tubercle and bunch of spines, natural size; 10, bunch of spines, magnified twice; 11, fruit; 12, seed.

Pl. 7. Mamillaria phellosperma: 1, a flowerless plant; 2, a bunch of spines; 3, a tubercle with the axillary wool and bristles, and the terminal bunch of spines twice magnified; 4–6, bunches of spines with one or more hooks, twice the natural size; 7–8, fruits of different size; 9, seed.

Pl. 8, Fig. 1–8. Mamillaria Wrightii: 1, a whole plant in fruit, from a sketch of Mr. Moellhausen's; 2, a young, and 3, an old tubercle with spines of the same specimen; 4–6, spines of a specimen from the Copper mines, four from the older part of the plant; 7, flower; 8, seed.

Fig. 9–14. Mamillaria Goodrichii: 9, tubercle with spines; 10, bunch of spines, natural size; 11–12, tubercles with the axillary wool and bristles, and the spines; 13–14, bunches of spines; the last four figures are magnified twice.

Pl. 9, Fig. 1–3. Mamillaria meiacantha: 1, whole plant in flower; 2, fruit; 3, seed.

Fig. 4–14. Mamillaria Heyderi, var. applanta: 4, upper part of plant in flower and fruit; 5–6, different views of flowers; 7, fruit; 8, seed, all from the same specimen from El Paso; 9–14, bunches of spines of different forms, of the same variety, from western Texas.

Fig. 15–17: bunches of spines and seed of the var. hemisphærica, from Matamoras.

Fig. 18–20. Mamillaria gummifera: different views of tubercles and spines.

Pl. 10. Mamillaria Echinus: 1, whole plant in fruit; 2–3, tubercles showing the groove and the wool on the basal areola; 4–7, bunches of spines of younger and older plants; 8–9, same, with the central spine curved; 10, fruit; 11, seed.

Pl. 11. Mamillaria pectinata: 1, whole plant in flower; 2–3, different views of tubercles from the sides of the plant; 4–7, bunches of spines; 8–9, tubercles from the flower-bearing top of larger plants; 10, seed.

Pl. 12, Fig. 1–16. Mamillaria tuberculosa: 1, a large specimen in fruit; 2–11, tubercles and bunches of spines of different specimens; 2–3, from a young plant; 10, a very young tubercle; all the tubercles exhibit the large mass of dense wool at base; 12, flower bud; 13, flower; 14, fruit; 15, seed of the same; 16, seed of another specimen, smaller, and with smaller marks.

Fig. 17–22. Mamillaria dasyacantha: 17–20, tubercles and bunches of spines of different specimens; 21–22, seeds of the same.

Pl. 13. Mamillaria radiosa, var. Neo Mexicana: 1, a plant with several branches in flower; 2 and 3, different tubercles with bunches of spines, the woolly grooves extending more or less down along the upper side of the tubercle; 4, a bunch of spines; 6, a fruit; 7, seed.

Pl. 14. Mamillaria macromeris in flower.

Pl. 15. *The same:* 1, one of the largest bunches of spines; 2, one of the smallest ones; 3, a young tubercle not fully developed; 4, a young, but full-grown tubercle, bearing the flower at the lower end of the woolly groove, far above the axil; a younger tubercle attached to it; 5, a ripe fruit with a few scales; 6 and 7, seeds of the largest and the smallest kind.

Pl. 16. Mamillaria fissurata: 1, a flowering plant; 2, petals; 3, nine tubercles of different size and age, and in different positions; 3, a large tubercle from above; 4, same from below; 5, same from the side; 6, a smaller one, with fewer divisions from above; 7, side view of same;

8, a small tubercle from above; 9, a young one with the silky wool yet straight and smooth; 10, a young tubercle bearing a fruit, which becomes visible after separating the wool; 11, seed.

PL. 17, ECHINOCACTUS SCHEERII: 1, a full-grown plant in flower; 2, part of a rib, front view, showing the form of the tubercles and their grooves; 3, part of a rib, side view; 4–6, bunches of spines; 7, seed.

PL. 18. ECHINOCACTUS BREVIHAMATUS: a full-grown plant of ordinary size.

PL. 19. *The same:* 1, part of a rib, side view, to exhibit the tubercles and their grooves; 2, part of a rib almost in front, with a flower; 3, a tubercle with a flower at the base of the long groove; 4, a young bunch of spines from a small specimen; 5–8, bunches of spines from different full-grown specimens.

PL. 20. ECHINOCACTUS SETISPINUS: 1, top of a plant with flower; 2, another flower; 3, flower bud; 4–6, bunches with twelve radial and one central spine of different size and shape; 7–9, bunches with more radial, and sometimes more central spines; 10, bunch of spines with two almost straight central spines; 11, fruit; 12, several seeds attached to the funiculi, four times magnified; 13, seed of the usual size and form; 14, larger seed of a specimen from Eagle Pass, to which spines fig. 8, belong.

PL. 21. ECHINOCACTUS LONGEHAMATUS: part of a rib with a flower.

PL. 22. *The same,* a rib, side view, showing the tubercles, and with their short grooves and their flexuous spines.

PL. 23. *The same:* 1, a bunch of spines of the longest spined variety; 2, a fruit; 3, seed; 4 and 5, bunches of spines of the smaller variety.

PL. 24. *The same:* 1, a bunch of spines of the thick spined Mexican form; 2 and 3, lower central spines of the same; 4, seed of the "*Limas agrias,*" the sour cactus-berries of Saltillo, to exhibit the peculiar form of the seed, and the great favosity of the surface.

PL. 25. ECHINOCACTUS WISLIZENI: 1, upper part of a rib with a flower and a flower bud; 2, pistil; 3, fruit; 4 and 5, seeds of different form and surface, from El Paso; 6, seed of different shape, from the upper Gila.

PL. 26. *The same:* 1–3, bunches of spines of different shape and proportion.

PL. 27. ECHINOCACTUS LE CONTEI: 1, part of a rib with a fruit; 2, a bunch of spines; 3, a flower; 4, section of same; 5, seed.

PL. 28. ECHINOCACTUS EMORYI: 1, bunch of spines of a large specimen, from Guaymas; 2, young bunch of spines with flower, from Sonora; 3, section of flower.

PL. 29. ECHINOCACTUS VIRIDESCENS: 1 and 2, bunches of spines of a young plant; 3, flower; 4, pistil; 5, fruit, not fully ripe and therefore a little shrivelled; 6, seed.

PL. 30. ECHINOCACTUS CYLINDRACEUS: 1, a bunch of spines of a young specimen; 2–5, bunches of spines of older, but not yet fully grown specimens.

PL. 31. ECHINOCACTUS HORIZONTHALONIUS, in flower.

PL. 32, fig. 1–5, *the same;* 1, a young plant; 2–4, spines of different forms; 5, seed.

Fig. 6–7. ECHINOCACTUS PARRYI, bunches of spines.

PL. 33. ECHINOCACTUS TEXENSIS: 1, a larger; 2, a smaller bunch of spines; 3, flower; 4, fruit; 5, seed from Texas; 6, seed from Matamoras, smaller and more distinctly marked than fig. 5.

Fig. 7. Seed of ECHINOCACTUS SANDILLON, *Gay,* from Chili, which has also a woolly fruit.

PL. 34. ECHINOCACTUS INTERTEXTUS: 1, a plant of rather large size, in flower; 2–5, young bunches of spines, more or less developed; 6–8, old bunches of spines; 9, fruit, with a few scales, with wool at base and the dry flower on top; 10, seed.

Pl. 35, fig. 1–5. Echinocactus intertextus, var. dasyacanthus: 1, 1–2, young bunches of spines; 3–5, old ones.

Fig. 6–8. Echinocactus unguispinus, bunches of spines.

Pl. 36. Cereus viridiflorus: 1, large plant from the Limpia in flower, one flower fully, another one half open; 2, bunch of spines of this plant without, and 3 with a central spine; 4–7, bunches of spines of a specimen collected by Dr. Bigelow on the upper Pecos, with 1 or more central spines; 4, a very young bunch; 5, a full grown one; 6, a similar larger one like the former, with 2 central spines; 7, another one, with the largest central spine curved upwards; 8–10, bunches of spines with and without a central spine, from plants collected by Dr. Wislizenus in northeastern New Mexico; 11, part of a plant in flower, with very obtuse petals and very small spines, collected by A. Fendler at Santa Fé; 14, fruit from Santa Fé; 15, seed of the same; 16, fruit from the Limpia.

Pl. 37. Cereus chloranthus in full bloom.

Pl. 38. *The same:* 1, top view, exhibiting the rays formed by the central spines; 2–7, different bunches of spines; 8, a small fruit; 9, one of usual size; 10, seed of common size; 11, smaller seed.

Pl. 39. Cereus dasyacanthus, a simple, branchless plant, with one flower.

Pl. 40. *The same:* bunches of spines, different in size, number, and proportion of the spines; all twice magnified.

Pl. 41, fig. 1–2. *The same:* 1, fruit; 2, seed.

Fig. 3–5. Cereus Roetteri: 3–4, bunches of spines, magnified twice; 5, a fruit.

Pl. 42. Cereus ctenoides: 1, a large specimen in flower; 2–3, front view and lateral view of a bundle of spines, twice magnified; 4, top part of another specimen, in which the spines are not so closely pectinate; 5–6, spines of this specimen, twice magnified.

Pl. 43. Cereus cæspitosus: a specimen of one of the largest forms; petals unusually curled.

Pl. 44. *The same:* 1–4, spines of the larger form, in different states of development, magnified twice; 5–7, spines of the smaller form, also magnified twice; some of the bunches show rudiments of central spines; 8, a fruit with the rudiments of the flower shrivelled up; 9, a fruit exhibiting yet the tube of the flower very distinctly; 10–11, seed of the larger, and 12, seed of the smaller form; 11, *g*, young seedling soon after germination.

Pl. 45. Cereus longisetus.

Pl. 46. Cereus stramineus: One head out of a plant with numerous heads.

Pl. 47. *The same:* Another head with smaller spines, seen from above; 2–4 bunches of spines; 5, fruit; 6, seed of the same, usual size; 7, seed of another specimen larger than usual.

Pl. 48. Fig. 1. A flower of the same.

Fig. 2–4. Cereus enneacanthus: 2, part of a stem showing the ribs and spines and a flower from El Paso; 3, flower of a specimen from Eagle Pass; 4, bunch of spines from El Paso; which, however, may belong to a form of C. stramineus; lower central spine triangular and much flattened.

Pl. 49. *The same:* 1, head of a specimen from Eagle Pass; 2, another one with longer and stouter spines; 3–10, bunches of spines of plants collected at Eagle Pass and at El Paso; 10, with a curved central spine; 11, fruit, belonging to flower, fig. 3, of last page; 12, seed of same.

Pl. 50. Cereus dubius: 1, part of a rib with a flower; 2, bunch of spines, and 3, seed of same plant; 4–5, bunches of spines of another specimen; 6, same, with flower just closed; 7, fruit, and 8, seed of same.

Pl. 51. Cereus Fendleri: A vigorous head of a plant brought from El Paso.

Pl. 52. *The same:* 1, top of a plant with flower-bud and flower from El Paso; 2, fruit with few and stouter spines; 3, seed of same; 4, fruit with numerous slender spines; 5, seed of same; 6, another form of seed.

Pl. 53. *The same:* 1, flower from Santa Fé; 2, young bunch of spines; 3–12, bunches of spines of different shape and size.

Pl. 54. Cereus polyacanthus in flower; usual form with short spines.

Pl. 55. *The same:* 1, part of a rib with a flower and a bud; 2–4, bunches of spines; 5, fruit with a bunch of spines; 6, seed of same; 7, fruit of another long-spined form; 8, seed of same.

Pl. 56. Cereus paucispinus: 1, an entire plant; 2, 5 bunches of spines; 6, seed.

Pl. 57. Cereus Engelmanni: 1, a head brought from Sonora by A. Schott; 2, young, and 3–4, older bunches of spines of the same; 5, fruit; 6, seed of same; 7, seed of Dr. Parry's original specimen.

Pl. 58. Cereus Berlandieri: 1, part of a plant with flower and flower-bud; 2–4, bunches of spines; 5, fruit; 6, seed.

Pl. 59. Fig. 1–11. Cereus procumbens: 1, a plant with flower-bud, flowers, and young fruit; 2–9, different bunches of spines; 10, fruit; 11, seed.

Fig. 12. Cereus tuberosus: seed.

Pl. 60. Fig. 1–4. Cereus Emoryi: 1, a fruit; 2, a bunch of spines of this fruit; 3, another one twice the natural size; 4, seed.

Fig. 5–6. Cereus variabilis: 5, fruit; 6, seed.

Pl. 61. Cereus giganteus: 1, part of the rib of an adult plant with two bunches of spines; 2, a bunch of spines; 3, part of a young rib of an adult plant collected in March; spines very short and slender yet; 4–5, bunches of spines of a young plant about eight inches high.

Pl. 62. *The same:* 1, flower; 2, fruit; 3, seed; *m*, side view of embryo, cotyledons a little open; *n*, front view of same.

Pl. 63. Cereus Greggii *α*. cismontanus: 1, a flower; 2, a young plant raised from seed in the third year, showing the tuberous root.

Pl. 64. *The same:* 1, lower part of a stem with the large tuberous root; half the natural size; 2–4, sections of the stem; 5–11, spines of different states of development and of different ages; all four times the natural size; 5, a bunch of very young spines imbedded in the wool of the areola; 6–10, full grown spines; 10, shows the lower spines crossed; 11, represents a very old bunch of spines; 12, a fruit; 13, seed.

Pl. 65. Cereus Greggii, *β*. transmontanus: 1, flower; 2–3, spines; four times magnified.

Pl. 66. Opuntia stenopetala: 1, part of a joint; 2, part of another one with two flowers; 3, section of flower.

Pl. 67. Opuntia Strigil: 1, an elongated joint with two fruits, bearing a young joint; 2, an orbicular joint; 3, several seeds.

Pl. 68. Opuntia filipendula: 1, a whole plant in flower, half natural size; 2, a joint with flower and young fruit, natural size; 3, seed of this plant from below El Paso; 4, seed of same from Doña Ana, above El Paso, a little smaller.

Pl. 69. Opuntia macrorhiza: 1, a whole plant with flower and buds, half natural size; 2, fruit natural size; 3–4, seeds of different size.

Pl. 70. Opuntia Emoryi, from the region southwest of El Paso, in fruit.

Pl. 71. *The same:* 1, a whole plant, reduced; 2, lateral view of a tubercle with a bunch of spines; 3, front view of one of the largest bunches of spines; part of the central spine, four times magnified; 4, different seeds.

Pl. 72. Opuntia Grahami: 1, whole plant, with large tuberous roots, and in fruit; 2, a young joint; 3, a bunch of spines of the usual form; 4, another one with broader central spines; 5, seed. The seed, as well as parts of spines, are four times magnified.

Pl. 73, Fig. 1–3. Opuntia Schottii: 1–2, bunches of spines, with parts four times magnified; 3, seed with an oblique embryo.

Fig. 4. Opuntia Schottii, var. Greggii: a bunch of spines, with part magnified four times.

Fig. 5–6. Opuntia bulbispina: 5, an entire joint; 6, a bunch of spines, part of central spine four times magnified.

Fig. 7–8. Opuntia imbricata: 7, a joint; 8, a bunch of spines, and fragment of central spine, four times the natural size, showing the sheath.

Pl. 74. Seeds of—1, *Mamillaria calcarata;* 2, *Mamillaria compacta;* 3, *Mamillaria vivipara;* 4, *Mamillaria radiosa*, var. *borealis;* 5, *Mamillaria radiosa*, var. *Texana;* 6, *Mamillaria nutallis a borealis;* 7, *β cæspitosa;* 8, *Mamillaria robusti spina;* 9, *Echinocactus uncinatus;* 10, *Echinocactus uncinatus*, var. *Wrightii;* 11–14, *Echinocactus sinuatus;* 11, from the San Pedro, Wright; 12, from northern Mexico, Gregg; 13, from the same regions, Poselger; 14, the form sent by Poselger under the name of *Echinocactus robustus;* 15, *Cereus Thurberi;* 16, *Cereus Schottii.*

Pl. 75. Seeds of *Opuntia:* 1–4, *Opuntia Engelmanni;* 1, from Chihauhua, Wislizenus; 2, from Matamoras; 3, from Presidio, Bigelow; 4, from Santa Rosa, Bigelow; 5–7, *Opuntia dulcis*, Wright and Bigelow; 8, *Opuntia macrocentra*, Wright; 9–13, *Opuntia phæacantha;* 9, from Santa Fé, Fendler; 10–13, Southern New Mexico, Wright; 14, *Opuntia tenuispina*, El Paso; 15, *Opuntia arenaria*, El Paso; 16–17, *Opuntia arborescens;* 18, *Opuntia fulgida;* 19, *Opuntia mamillata.*

The maps accompanying this memoir represents the geographical distribution of the different species of *cactaceæ* in the United States and adjacent regions, as far as at present known.

Department of the Interior,

Pacific Wagon Road Office, November 26, 1858.

The foregoing paper on the Cactaceæ of the Boundary having been printed about two years ago, before the author's visit to Europe, it is deemed advisable, in justice to Dr. Engelmann, to append the following corrections made by him since his return.

ALBERT H. CAMPBELL,

In charge of Mexican Boundary Report.

CACTACEÆ OF THE BOUNDARY.

CORRECTIONS.

CACTACEAE OF THE BOUNDARY.

CORRECTIONS.

A voyage to Europe, since my paper has gone through the press, has afforded me the advantage not only of the personal intercourse with numerous men of science and many cultivators, but also of an actual examination of various large collections of living *cactaceae*. Some of the results of my investigations, as far as they bear upon the *Cactaceae of the Boundary*, have been incorporated with the list of corrections of typographical errors.

Page 2, line 22. *Sepalis petalisque.* It will scarcely be necessary to inform the reader that the numerous foliaceous integuments of the cactus-flower do not very properly range under the divisions of *sepals* and *petals*. For convenience sake, however, the exterior more herbaceous ones are called *sepals*, and the interior ones, with thinner texture and brighter color, are named *petals*. The "*sepals*" usually are more numerous than the "*petals*," and, in most genera, form a complete transition from the organs, which on the stem, represent the leaves, (usually with their spiny appendages) to the petals. On the ovary they usually resemble the former, which, among other reasons, seems to give color to the suggestion of Zuccarini mentioned in the note to page 39, line 29.

Page 2, note, line 10, omit *or*.

Page 2, note, line 15: after *found* omit ,.

Page 4, line 12: I follow De Candolle in giving, as one of the characters of the species, the number of the more distinct spirals of the tubercles in *Mamillariae* and cylindric *Opuntiae*, just as we describe the number of ribs of *Echinocacti* or *Cerei*. It is now well known that no character can be deduced from the direction of the spirals to the right or left. It is also known that the greater or less prominence of one or the other spiral depends on the number and crowded state of the tubercles and the comparative thickness and elongation of the axis. The characters deduced therefrom are not absolute, nor are they quite scientific. It would be more exact to state the phyllotactic law of the arrangement of the tubercles. I would have to say that *M. micromeris* has its tubercles arranged after the $\frac{1}{3}\frac{3}{4}$ or even the $\frac{2}{5}\frac{1}{5}$ system. But I suppose the plan followed by me is more intelligible to most readers, and not much less clear to the scientific phyllotaxist.

Page 5, line 4. *M. microthele* is well distinguished from our species by its much larger tubercles and two unusually stout and short central spines.

Page 5, line 36. The pale yellow spines look like the fibres of raw silk, and form a silk-like tuft, but are not *tipped by a brush*.

Page 6, line 25, for *pluribusve*, read *alterove*.

Page 6, line 29, after *hilum* omit —.

Page 7, line 7, for *umbillicus*, read *umbilicus*.

Page 7, line 15, after *dilatatis* put ;.

Page 7, line 28, for *tuberculata*, read *tuberculosa*. *M. Grahami* is nearly allied to *M. Schelhasii*, Pfr., from Real del Monte, Mexico. The next species, *M. Wrightii*, is closely allied to *M. zephyranthoides*, Scheidw., from Oaxaca, Mexico; without the flower, however, and especially without the fruit and seed, which latter has never been paid attention to. These plants can scarcely be sufficiently well characterized, nor their relationship ascertained.

Page 8, line 19, for Goodrichii, read Goodridgii.

Page 9, line 28, for *interior*, read *exterior*. *M. sphaerica* is almost too closely allied to the Mexican *M. longimamma*, DC.

Page 10, line 41. The plant here described as a variety exactly agrees with some original specimens of *M. Scheerii* preserved in the collection of Prince Salm-Dyck. It will not be useless here to urge the importance of preserving the dead cactus plants, or, as these specimens are fancifully called, the "*skeletons*." I have been materially assisted by being able to examine the skeletons of some authentic original specimens, of which no living ones are now found in the gardens. But generally the dead plants are thrown aside, and a description, often vague or incomplete, or at best an indifferent figure, is all that is left for future identification. Unscrupulous gardeners and traders do their best to increase the confusion.

Page 11, line 7, for *mucranatis*, read *mucronatis*.

Page 12, line 9, for *last*, read *next*. *M. pectinata* is probably not sufficiently distinct from *M. radians*, DC., and with it, and both the following species, *M. Echinus* and *M. scolymoides*, may belong to *M. cornifera*, DC., the two former being the forms without, and the three latter those with, central spines.

Page 14. *M. scolymoides*. A specimen brought by *Dr. Bigelow* has flowered. The flower greatly resembles that of *M. pectinata*, figured on plate 11, but is more of a reddish than yellow tinge. *Dr. Poselger* assures me that they also vary with white or whitish flowers. *M. tuberculosa* is clearly identical with *M. strobiliformis*, Scheer in Salm, Hort. Dyck, (1850,) as I have ascertained by a careful examination of the original specimen (now dead) in the collection of Prince Salm. Mr. Scheer's name, having the priority, must be substituted for mine.

Page 14, line 26, for *X., fig.* 1–6, read *XXII., fig.* 1–16.

Page 15, line 9, for 18, read 22.

Page 15, line 15, for *interior*, read *exterior*.

Page 16, line 5, for *tulis*, read *patulis*.

Page 17, line 9, for *spine*, read *spines*. *M. heteromorpha*, Scheer in Hort. Dyck, 1850, is the same species, to judge from the "skeleton" of the original specimen in Coll. Salm. *Anhalonium*. As the genera of *Cactaceae* are now constituted, *Anhalonium* will probably better be kept distinct from *Mamillaria*. A second section of the genus, with flattened tubercles arranged into ribs, would comprise *Echinocactus Williamsii*, Lem. The tufts of dense wool on this plant do not represent the (absent) spines, but are axillary productions, surrounding and partly including the flower and fruit. The ovary is perfectly naked, as in other *Anhalonia* or *Mamillariae*, which has already been noticed by others. The interesting *Leuchtenbergia Principis*, Fisch., may possibly have to be reduced to a third section of this genus. The flowers being borne just below the tip of the nascent tubercles, (which, when full grown, are three to six or seven inches long, prismatic or awl-shaped, and bear at the tip several flat flexible scales in place of spines,) the plant can have no affinity with *Cereus*. If the ovary should prove to be naked, the large flower and elongated tube would not be sufficient to separate it from *Anhalonium* Mr. Labouret, in his *Monographie des Cactées*, Paris, (without date, probably 1853,) page 162, notices the position of the flower. I have seen the young buds below the apex of the tubercle at Kew, and the scar left by the fallen fruit at Mr. Haage's in Erfurt, but could not meet with either flower or fruit itself. *A. fissuratum* is very nearly allied to the Mexican *A. sulcatum*, Salm, (*A. Kotchubei*, Lem.,) of which it seems no living nor dead specimen is at present extant in Europe. The upper surface of the tubercle of *A. sulcatum* is said to be deeply grooved, the groove being filled with silky tomentum; otherwise the tubercles are said to be smooth.

Page 17, line 36, for *applanta*, read *applanata*.

Page 20, line 24, for *superioribus*, read *mediis*.

Page 20, line 29, before *hilo* put ;.

Page 21, line 21, after *San Pedro*. put (*Tab. XX.*) Fig. 12 exhibits the enlarged *funiculi*, which consist of a loose juicy tissue. It seems that in most *Cactaceae* the *funiculi* towards maturity become large and juicy; usually their cells then burst, and form the so-called pulp, in which the seeds are described as nestling: "*semina nidulantia.*"

Page 21, line 24, for *albo*, read *albo*—.

Page 22, line 12, after *junioribus* insert *plerisque purpureis, adultis*.

Page 22, line 19, for *interioribus* read *superioribus*.

Page 22, line 24, after *crassispinus:* insert *aculeis robustissimis, radialibus* 8–11, *centralibus*, 4 *angulatis, infimo flexuoso plus minus hamato*.

Page 22, line 42, after *spines*, put *in var.* γ

Page 23, line 1, for *often*, read *when young*.

Page 23, line 14, after *annulated*, put , in place of ;. It ought to have been mentioned that the lower central spine is as long as the others or more commonly greatly exceeds them.

Page 23, line 41, put the (before *interdum* instead of before *aculeo*.

Page 24, line 22, for *ex* (*Parry*) read *ex Parry*).

Page 24, line 23, for *mimus*, read *minus*.

Page 25, last line, after *addita*, omit ,.

Page 26, line 1, for *angulatis*, read *annulatis*.

Page 26, line 11, after *distinct*, put ;.

Page 26, line 13, after *divergent;* omit ;.

Page 26, line 14, after *stoutest* put ,. *E. horizonthalonius;* numerous original specimens of this plant, living and dead, examined in European collections, leave no doubt of the entire identity of the different forms, which can scarcely be counted as varieties.

Page 28, line 1, after *intertextis* put ,.

Page 30, line 25, for *fig.* 1, read *fig.* 1–2.

Page 31, line 13, after *acutis* put ,.

Page 32, line 4, for *incisota*, read *inciso*.

Page 32, line 9, for ; before 12, put ,.

Page 32, line 42, for *XXXIII–XXXIV*, read *XLIII–XLIV*.

Page 32, last line, after *patulis* put ,.

Page 33, line 14, for *centralibus*, read *setaceis.*

Page 34, line 6, after *curvato.* add (*Tab. LI–LIII.*)

Page 35, line 39, for *those*, read *these.*

Page 37, line 7, for *to tubercles*, read *its tubercles.*

Page 37, line 26, for 6 *lines;* read 6 *lines*,.

Page 38, line 18, after *cultivation*, put *in St. Louis, Cincinnati, etc.*

Page 38, line 31, *C. pentalophus* is *erect* "10–15 inches high" only when so trained. It grows naturally like *C. Berlandieri*, *C. procumbens* and *C. Ehrenbergii*, Pfeif., all of which closely resemble one another in habit. *C. Pentalophus* has a 5-angled stem of bright green color with short spines; *C. Ehrenbergii* is usually 6-angled, pale green, with numerous long and setaceous spines; flower and fruit of either seem to be unknown.

Page 38, line 42, *LXIX*, read *LIX.*

Page 39, line 17, *LXIX*, read *LIX.*

Page 39, line 21. The root of young plants forms a single globose tuber, in older ones it consists of a cluster of several oval or cylindric tubers, sometimes 6 or 8 in number, 1–1½ inch in diameter, and 2–3 inches long.

Page 39, line 29, after *family*, add: or the specimen observed by Dr. Poselger offered one of those rare anomalies (one of which, found by Zuccarini in *Cereus serpentinus*, was figured by him in the Annals of the Munich Academy) where the ovary actually forms the continuation and termination of a branch, by which the sagacious observer just mentioned was induced to consider the so-called ovary of *Cactaceae* itself a branch, with the real ovary immersed in it. But how would he view it in *Mamillaria?*

Page 40, line 18, after *fruit*, omit *flower.*

Page 40, line 31, before *smooth*, insert *nearly.*

Page 40, line 31, before *linear*, put *or.*

Page 41, line 13. This is *C. Pottsii*, Salm, Hort. Dyck, a later name.

Page 42, line 14, after *brevioribus* put ,.

Page 42, line 16, for *albido*, read *albido—.*

Page 46, line 10, for *ovari*, read *ovarii.*

Page 46, line 26. Cultivated specimens of *O. grandis* are erect, because, tied to the stake, they are not permitted to grow otherwise. Their white spines seem to grow dark very soon, and the smaller number and greater distance of the spines may be owing to the influence of cultivation. There is, therefore, scarcely a permanent character left to distinguish the new species from this one.

Page 47, line 6, after *succosa*, omit ,.

Page 47, line 8. This *margin* is the enlarged and indurated *funiculus* itself, which, by a lateral expansion, envelopes the seed proper and forms its exterior bony coating. This dilatation of the *funiculus* takes place long before the flowering period; it covers the *ovulum* so completely that only two small lateral openings remain, which lead to the *orifice*. After Mr. Payen and others had already noticed this expansion of the *funiculus*, Dr. Caspary, of Bonn, lately has more completely investigated its nature. It appears that in many, if not in all other *Cactaceae* the funiculus is bent over the orifice of the *ovulum*, partly covering it; (I have seen it in some *Mamillariae*, *Echinocacti*, and *Cerei;*) but that only in *Opuntiae* it expands into an exterior seminal coat, which is distinguished from *arillus* proper only by its being already fully formed at the flowering period.

Page 49, line 16, for *Tuna,* read *Ficus Indica.*

Page 49, line 24, for *flaro*, read *flavo.*

Page 51, line 42, after 20–30 put ,.

Page 52, line 29, after *ovata;* omit ; and read : *aculeolis inaequalibus armata ; umbilico infundibuliformi ; seminibus*, etc.

Page 53, line 37, put *setosissimis* before *stipata.*

Page 54, line 16, for *pulvillis*, read *pulvilli.*

Page 54, line 17, after *Seeds*, insert *very different in size and shape.*

Page 54, line 18, after *fruit* put ,.

Page 54, line 34, for *ovata*, read *obovato—.*

Page 54, line 34, after *clavata* put ,.

Page 55, line 8, for *folii*, read *foliis.*

Page 56, line 13, for *first*, read *fruit.*

Page 57, line 14, omit *numerosis.*

Page 58, line 14, for 1012, read 10–12. *O. arborescens* seems to be very closely allied, if not identical, with *O. rosea*, DC., and *O. imbricata*, DC. The former is described from a figure; the flower and fruit of the latter remain unknown, so that it is difficult, if not impossible at present, to solve these doubts.

Page 59, line 4, for *Bubuquibari*, read *Babuquibari.*

Page 59, line 30. *O. Wrightii* may not be different from *O. Kleiniae*, DC., from Mexico, long cultivated in Europe, the flower of which does not seem to be known.

Page 60, line 21. *O. frutescens* seems identical with *O. gracilis*, Hort. Monac, and *O. virgata*, Hort. Vind., the flower and fruit of which are unknown. It is stated that the spines of *O. gracilis* are not vaginate. This is no doubt a mistake; but the sheath is probably not as loose as in others. It corresponds, therefore, with my var. *brevispina*, Synops. Cact. in Proc. Am. Ac. A. Sc., vol. III. In delicate specimens, and such are usually the cultivated ones, the spines of most of the cylindric *Opuntiae* do not exhibit the sheath very plainly; it usually adheres closely to the body of the spine. This *vagina* consists, like the whole spine, of elongated indurated cells; the barbs of the spine are covered by it and are closely adpressed until the vagina detaches itself which commonly takes place very early.

Page 61, column 2 line 30, for 2, read 64.

Page 61, column 2, line 39, for *Goodrichii,* read *Goodridgii.*

Page 62, column 1, line 25, omit entirely.

Page 62, column 2, line 10, for 6, read 68.

Page 64, line 14, for *Goodrichii*, read *Goodridgii.*

Page 66, line 13, before 14, put 12 *and* 13, *bunches of spines of this variety;.*

Page 68, line 18, for *nutallis* read *Nuttallii.*

Page 68, line 24, for *Chihauhua*, read *Chihuahua.*

Page 68, the *map* (not *maps*) mentioned in the two last lines has been necessarily left out.

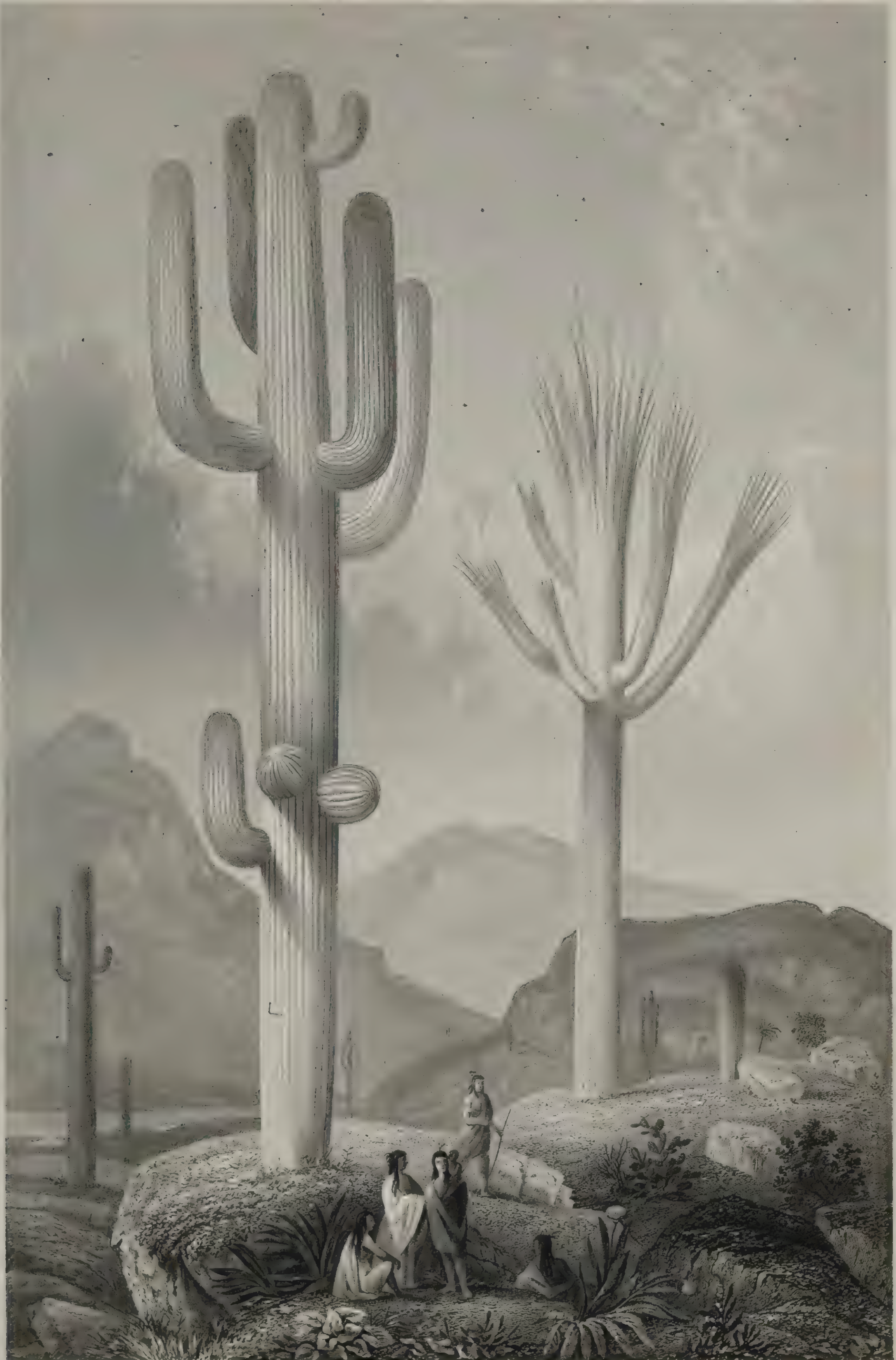
Mr. Paulus Roetter, of St. Louis, made the drawings for the plates under the close superintendence of the author. The steel engravings were done partly by Mr. W. H. Dougal, of Georgetown, D. C., a few by Messrs. Maillard & Connor, of St. Louis, and the balance by

European artists, viz: Mr. Weber, of Berlin, Prussia, and Mr. Davesne, Mr. Rebuffet, Mr. Martin Schmelz, and the brothers Picart, all of Paris, France. The high order of excellence of the engravings, especially of those of the Picarts and of Schmelz cannot fail to strike those who examine the plates.

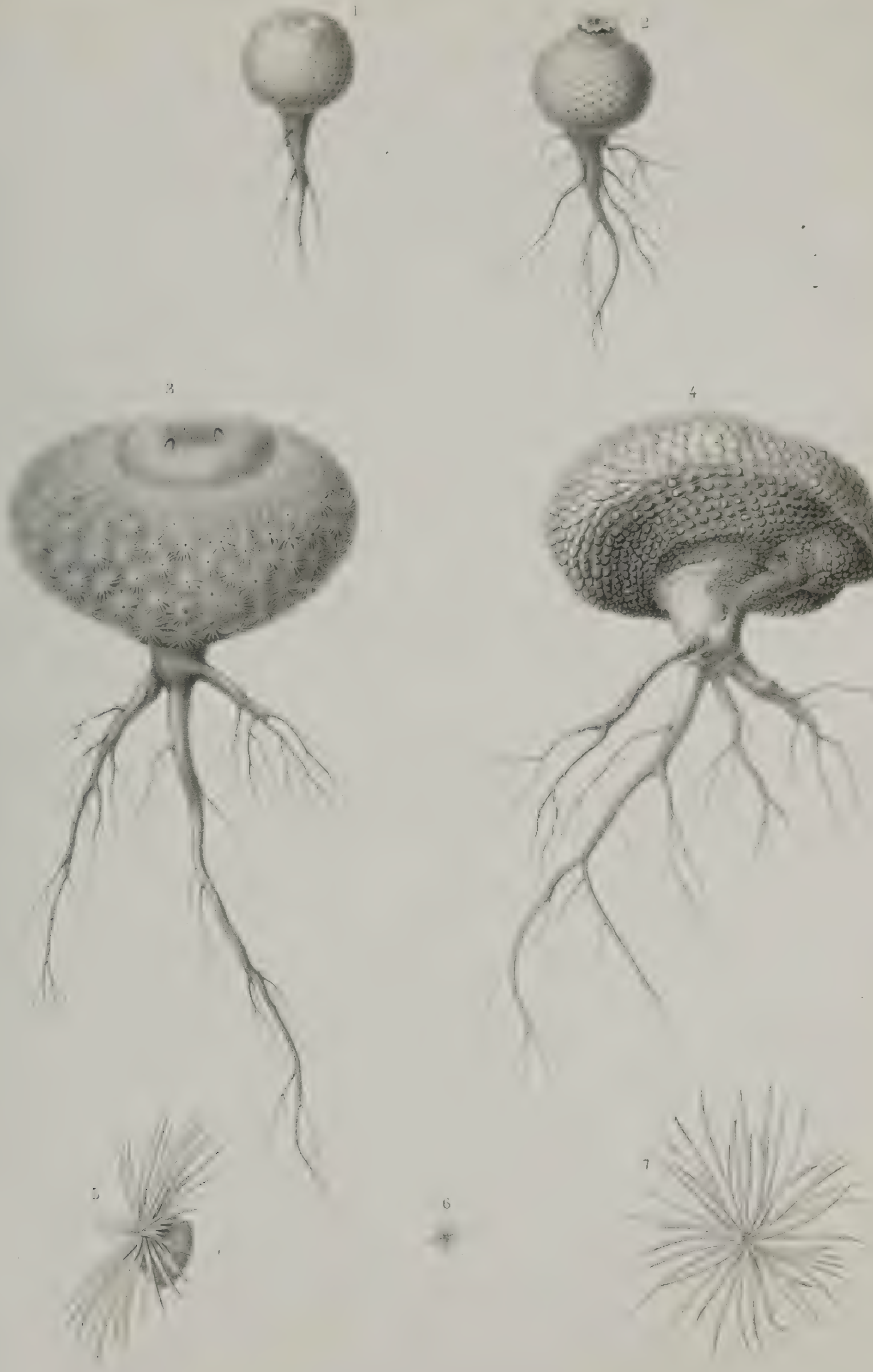
In the figures of the embryos in plate 24, 34, 41 and 47, the line indicating the division of the cotyledons does not show in all the copies. The embryo in plate 24 and 34 resembles that of pl. 74, fig. 9 and 10; and that of plate 41 and 47, is like that on plate 55.

GEORGE ENGELMANN.

St. Louis, *November*, 1858.

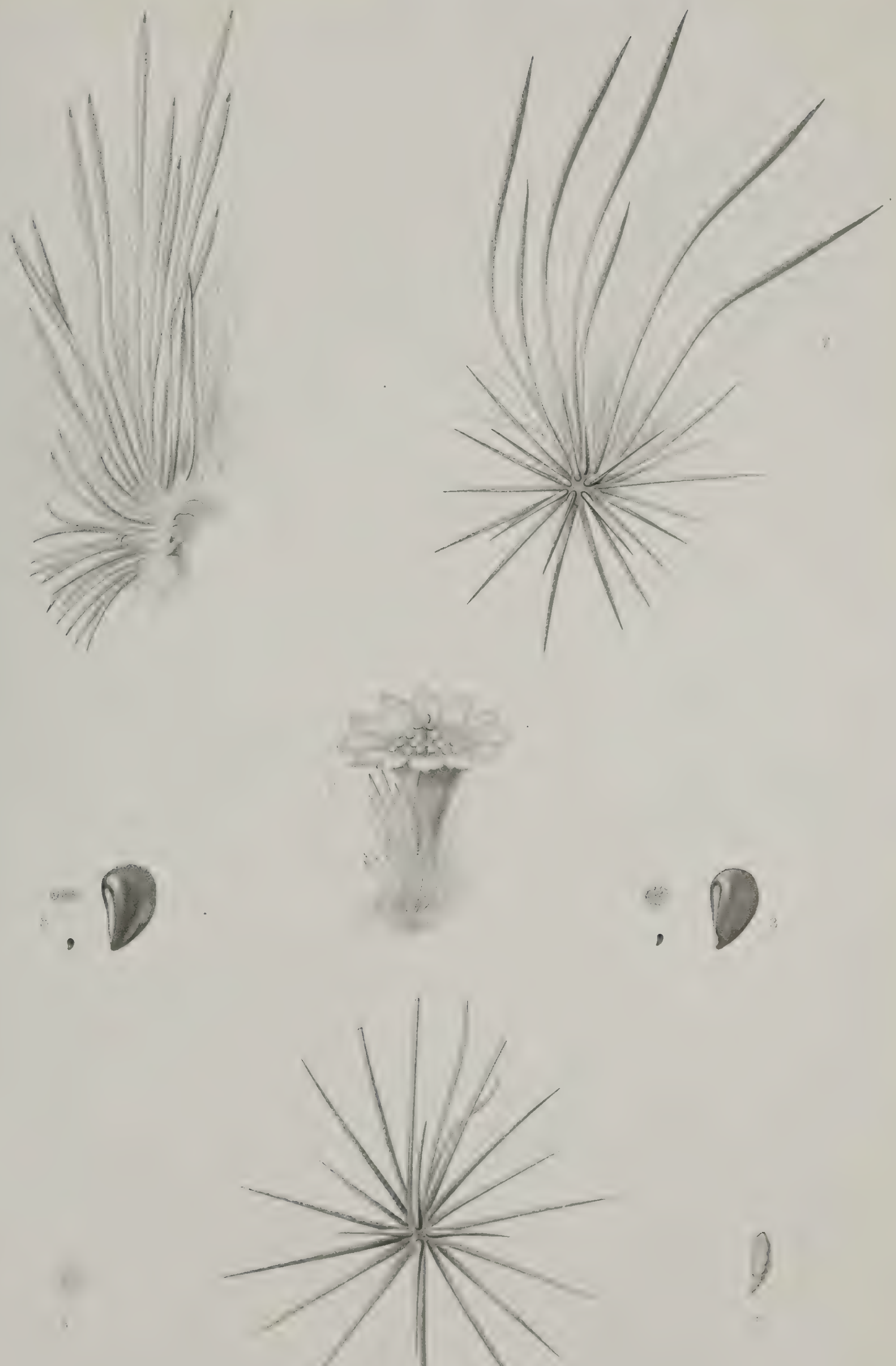


[illegible]



Roetter del. Picart sc

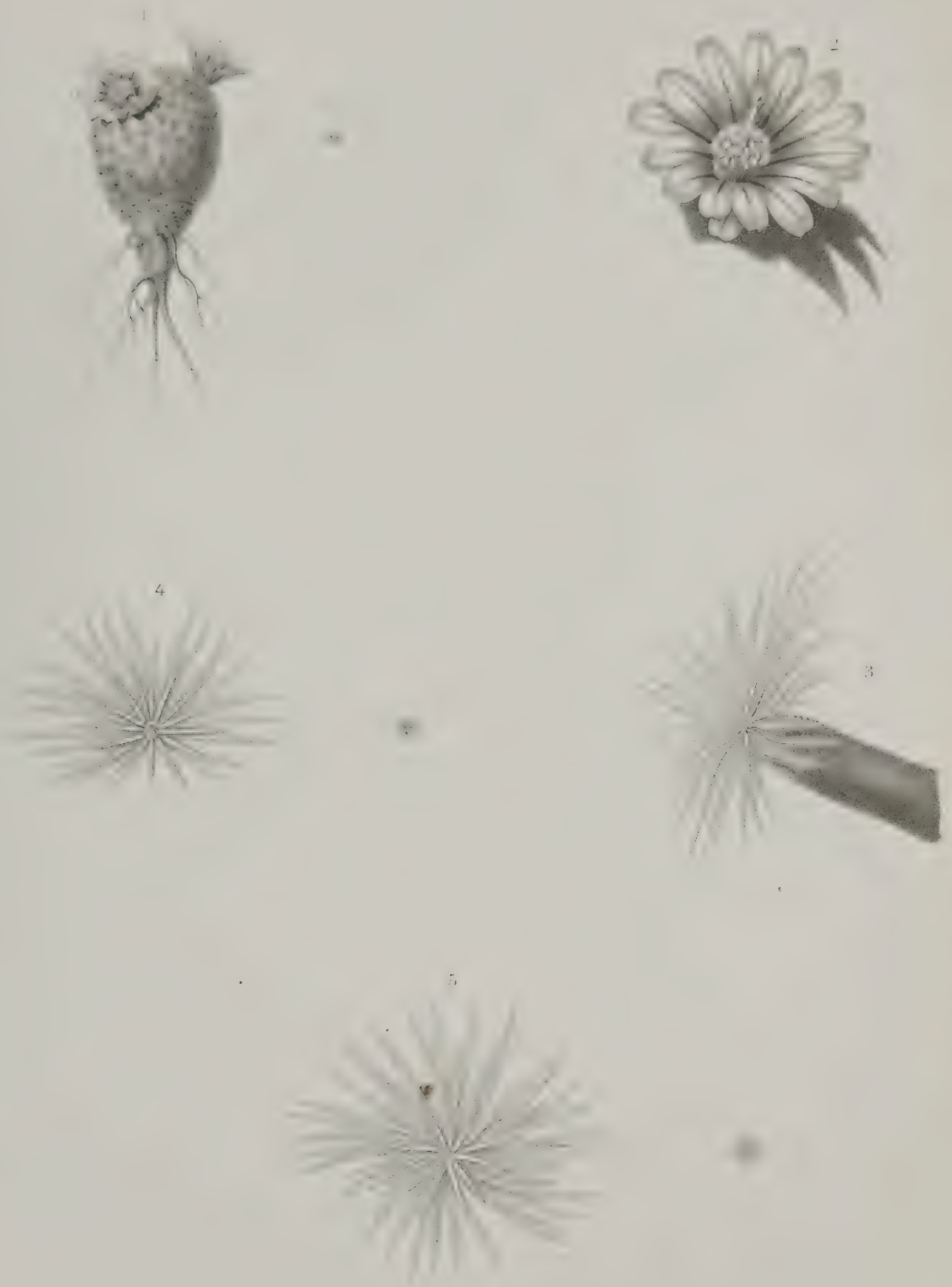
MAMILLARIA MICROMERIS



[illegible] del. M. Schmelz sc.

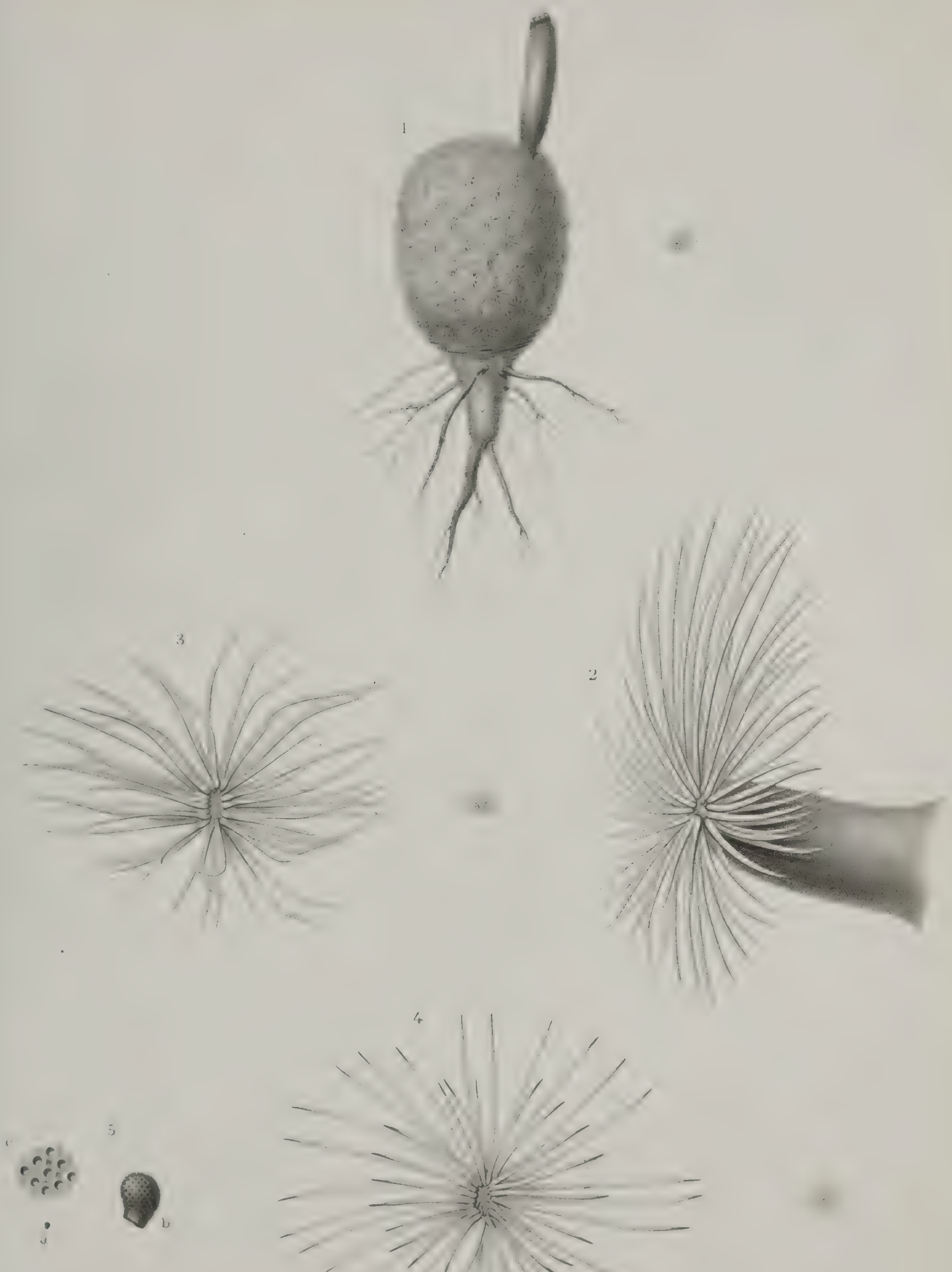
1-4 MAMILLARIA MICROMERIS

5-8 —— " —— —— " —— VAR. GREGGII



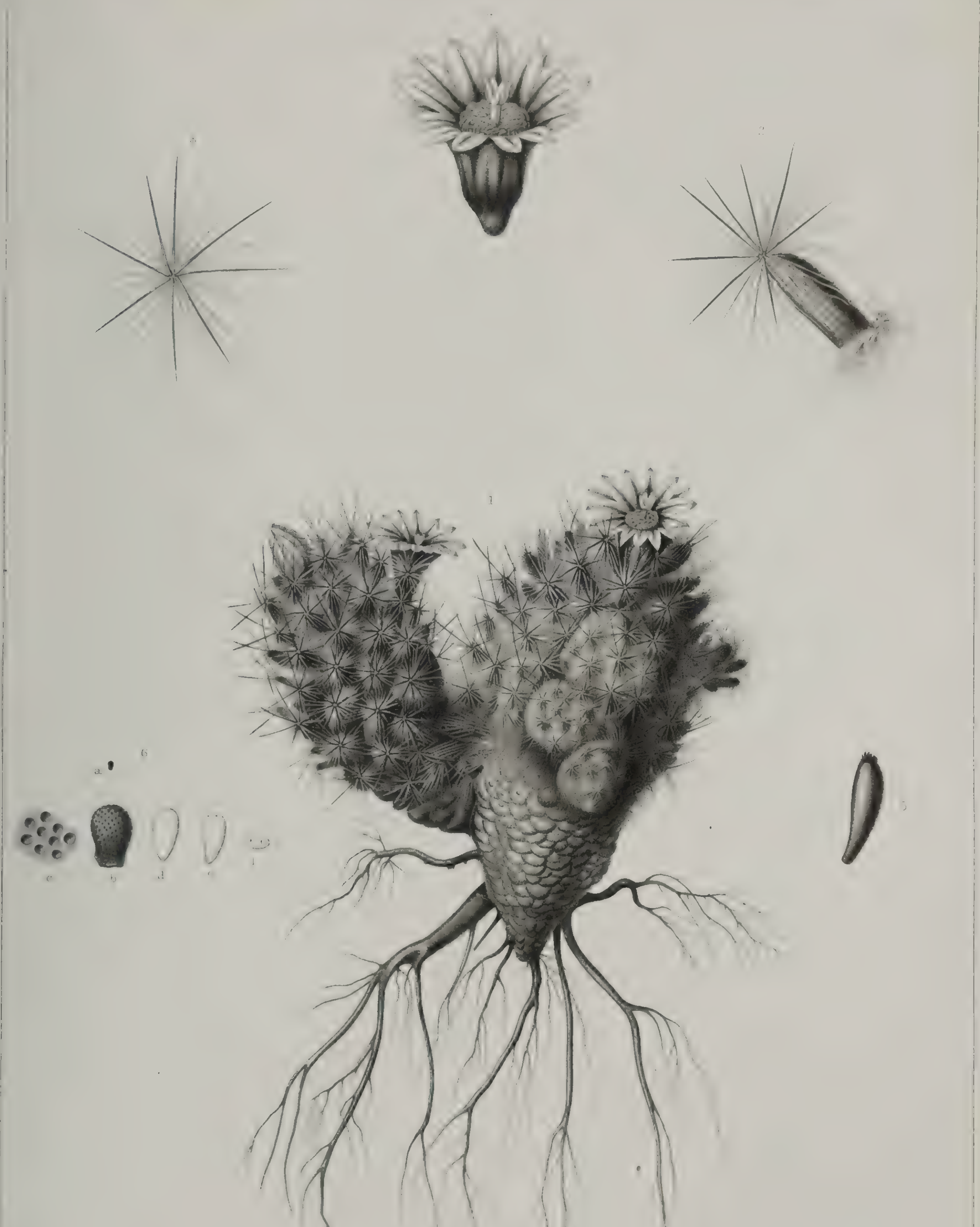
Roetter del Picart sc

MAMILLARIA LASIACANTHA



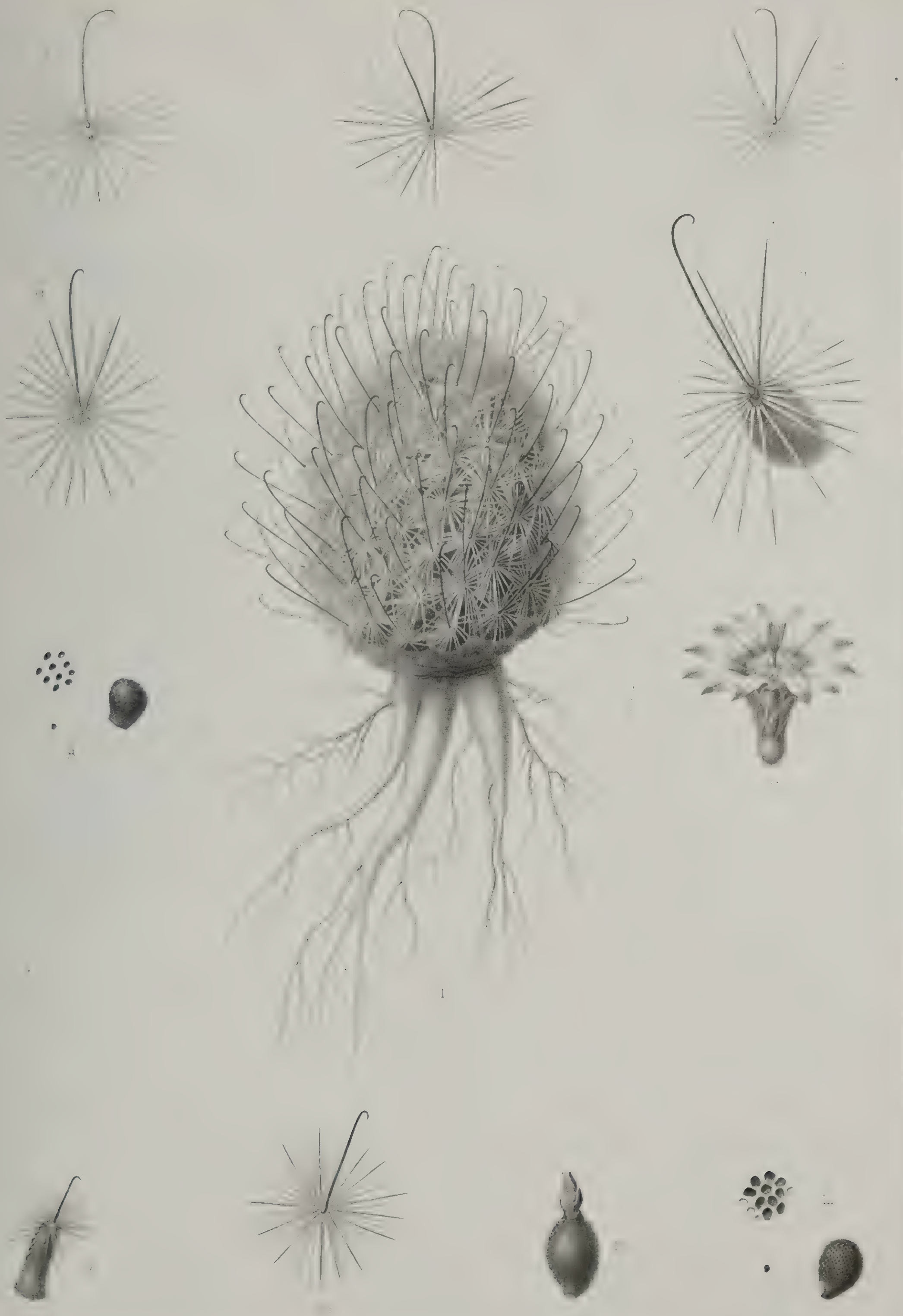
Roetter del. Picart sc.

MAMILLARIA LASIACANTHA, VAR. DENUDATA



Roetter

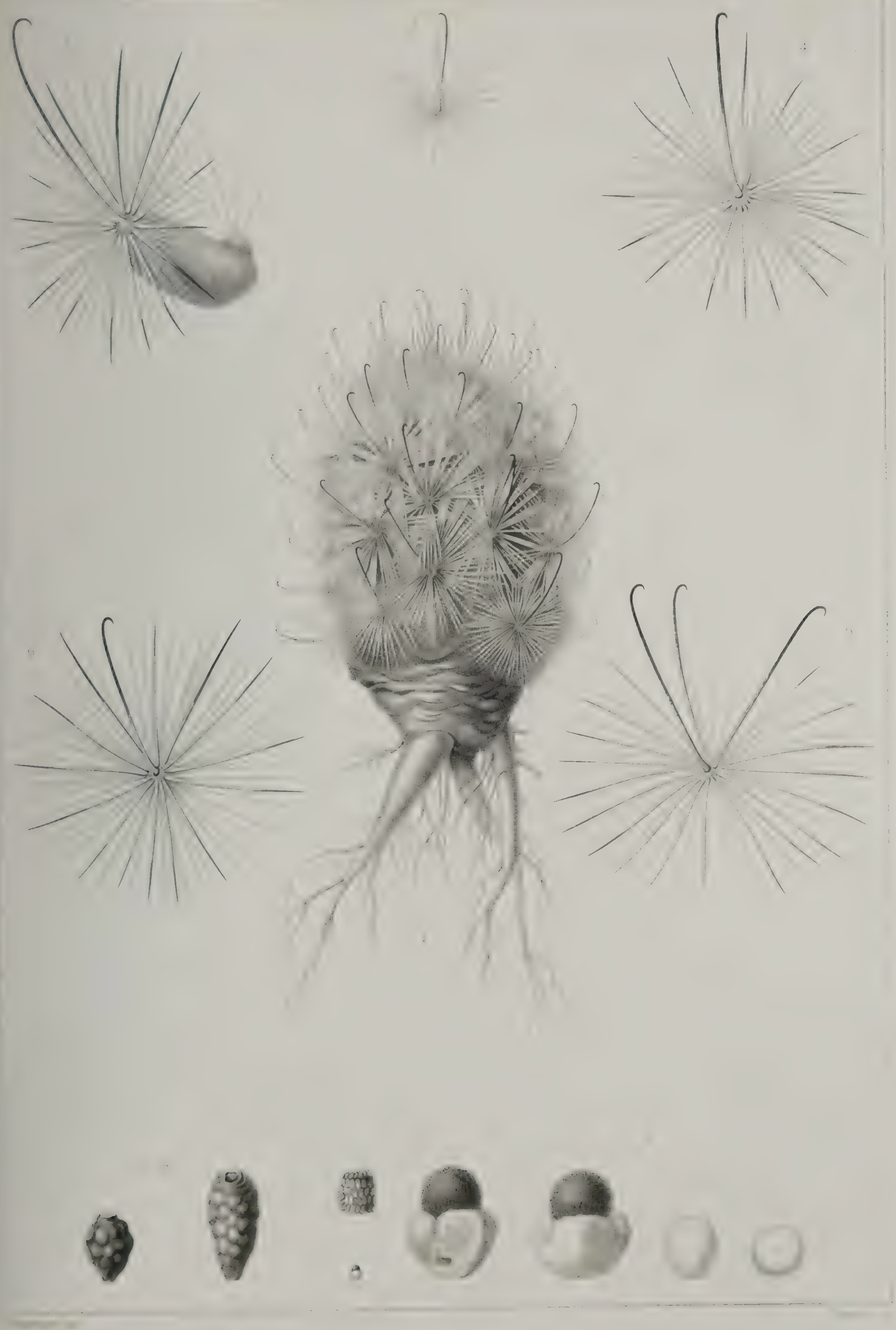
MAMILLARIA PUSILLA VAR TEXANA



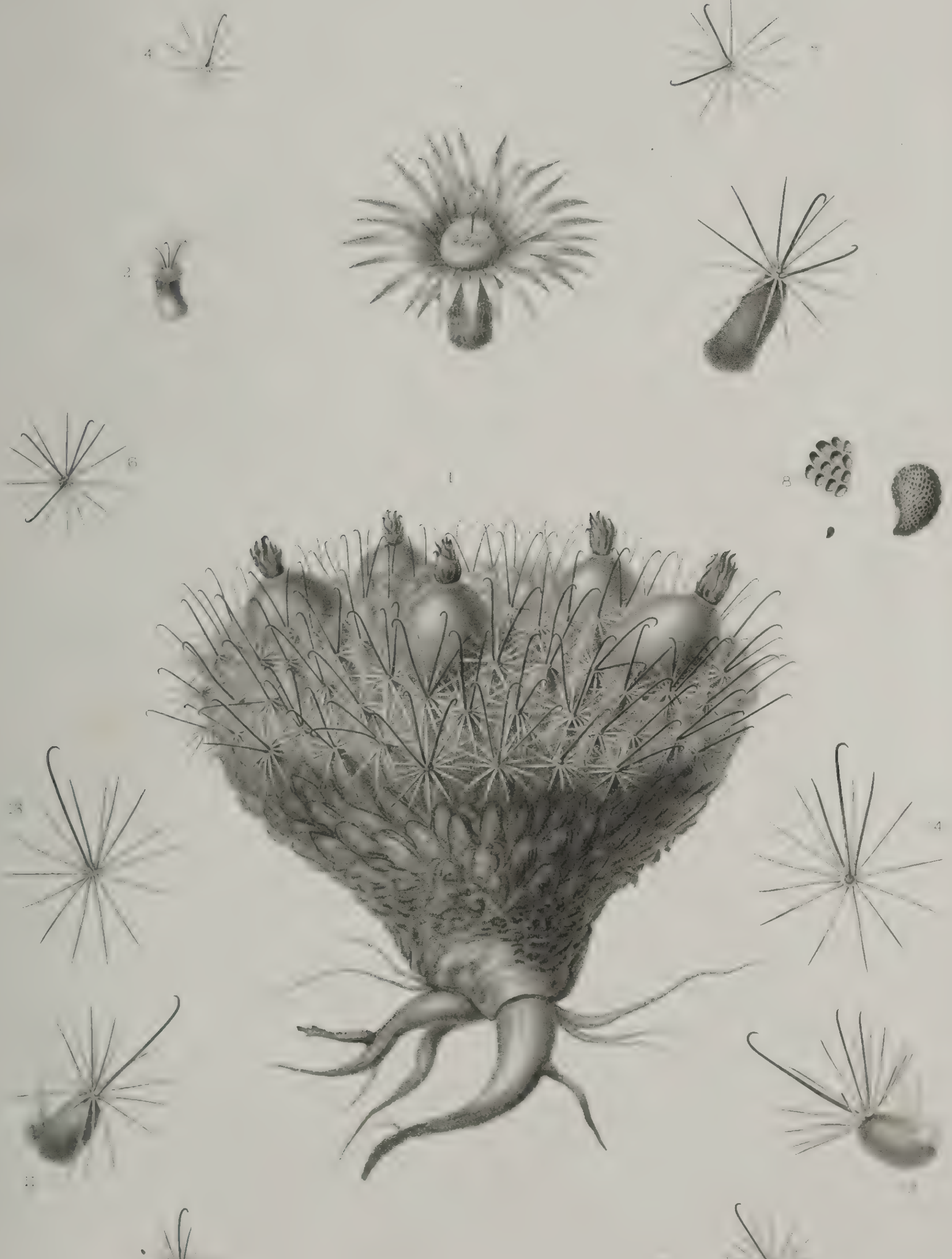
F Roetter del

1-8 MAMILLARIA GRAHAMI

9-12 MAMILLARIA BARBATA



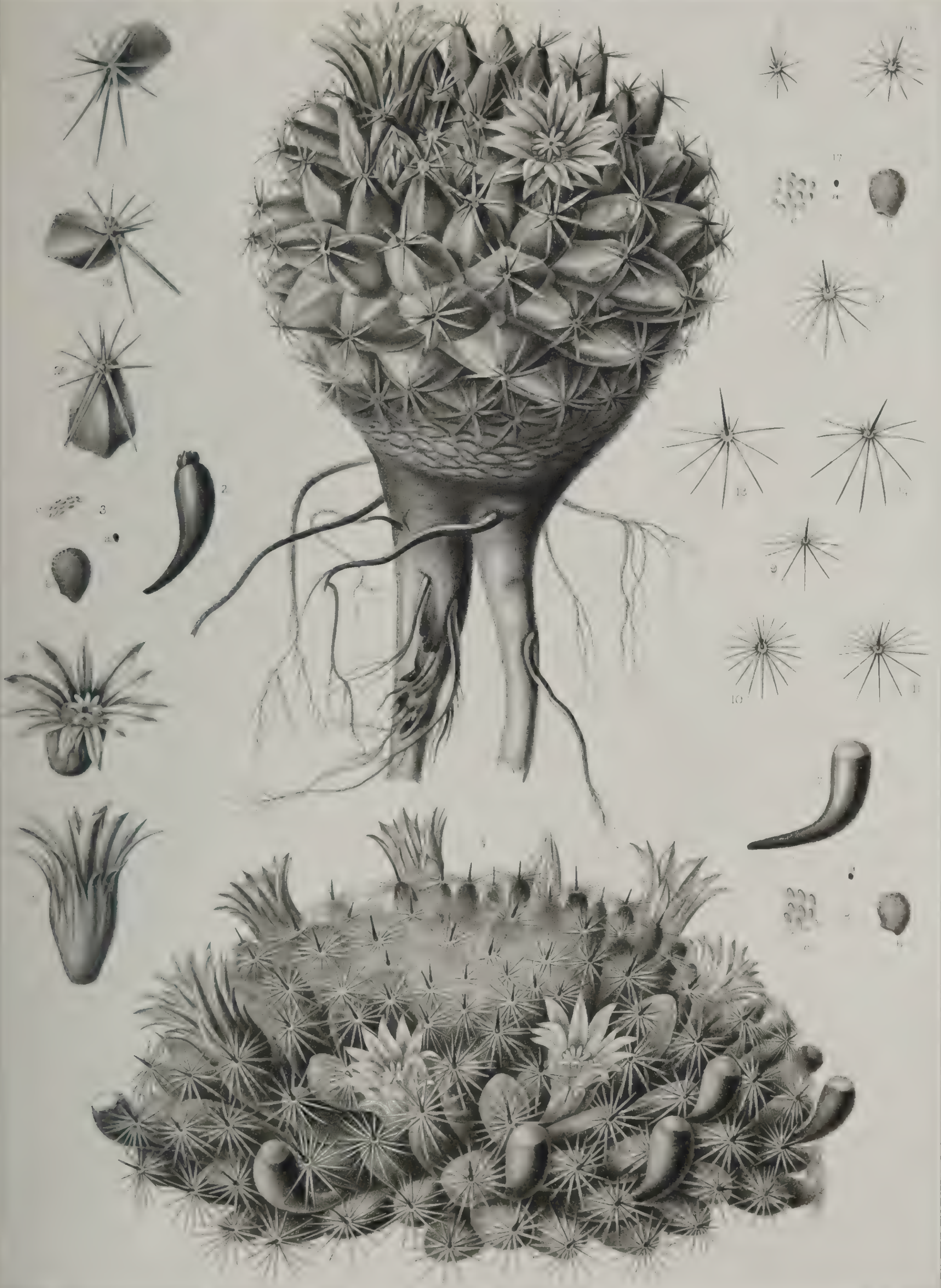
MAMILLARIA PHELLOSPERMA



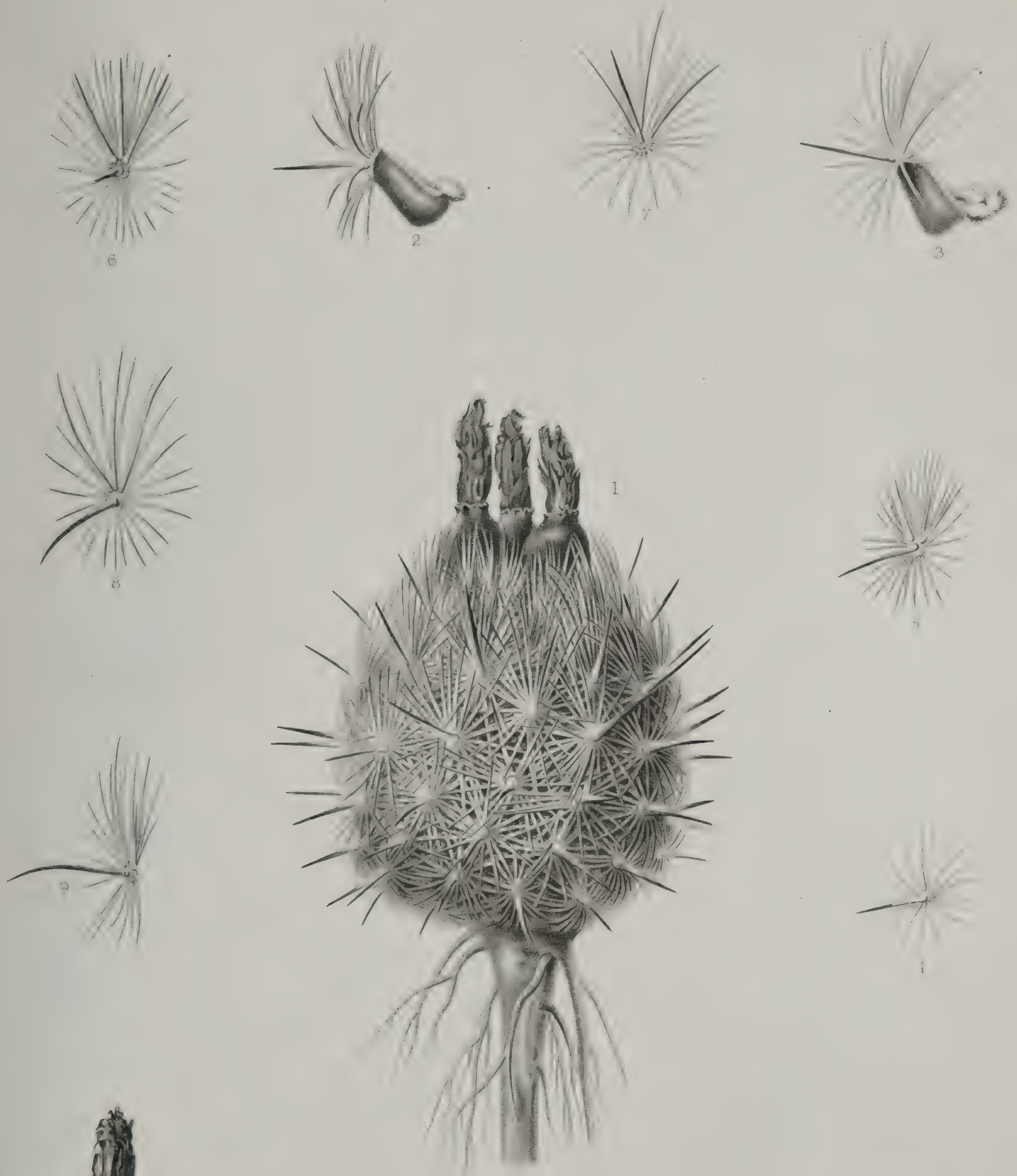
P. Roetter del.

1-8 MAMILLARIA WRIGHTII

9-14 MAMILLARIA GOODRIDGII

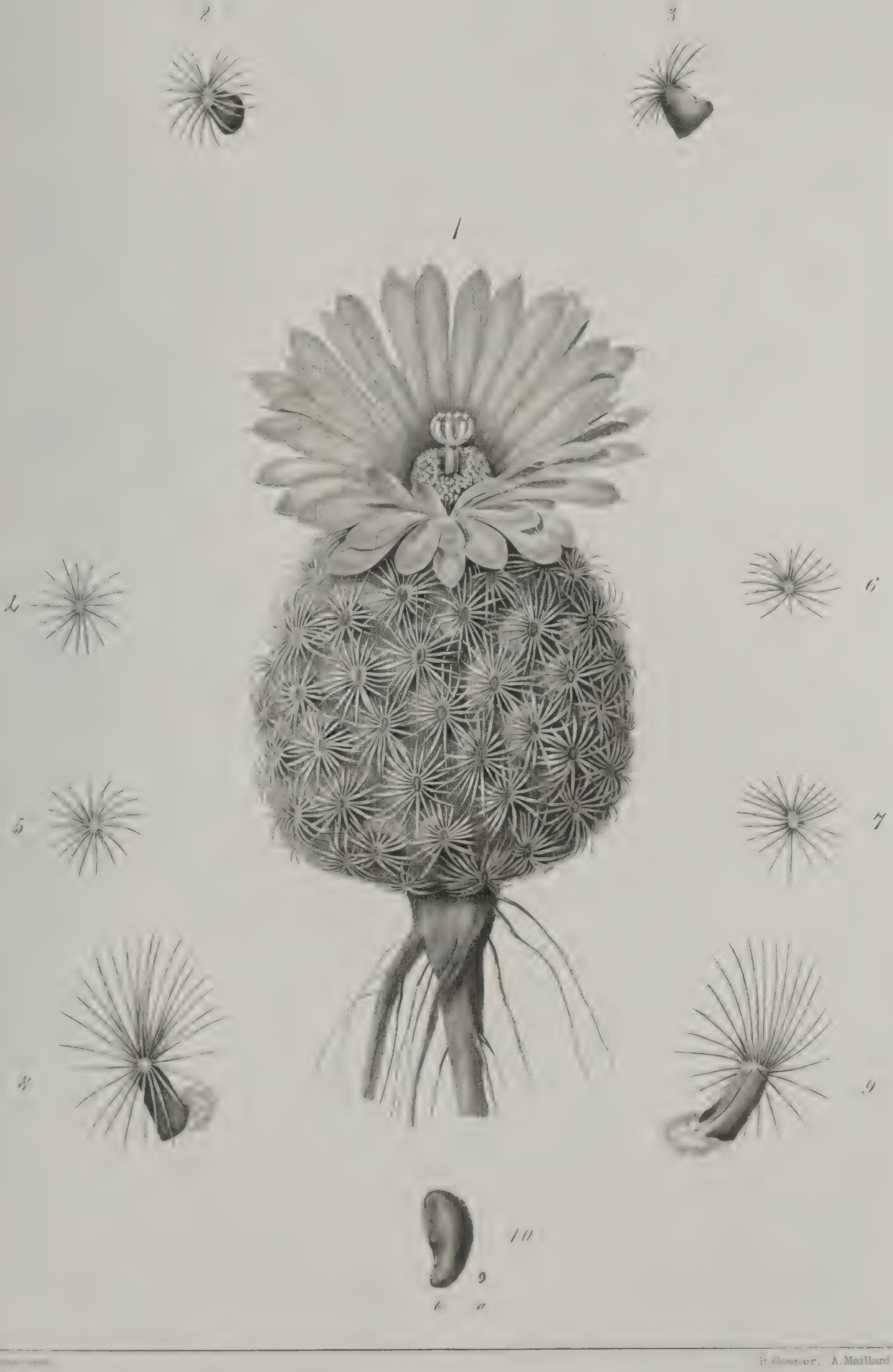


1-3 MAMILLARIA MEIACANTHA 4-14 M HEYDERI VAR APPLANATA
15-17 VAR HEMISPHAERICA 18-20 M GUMMIFERA



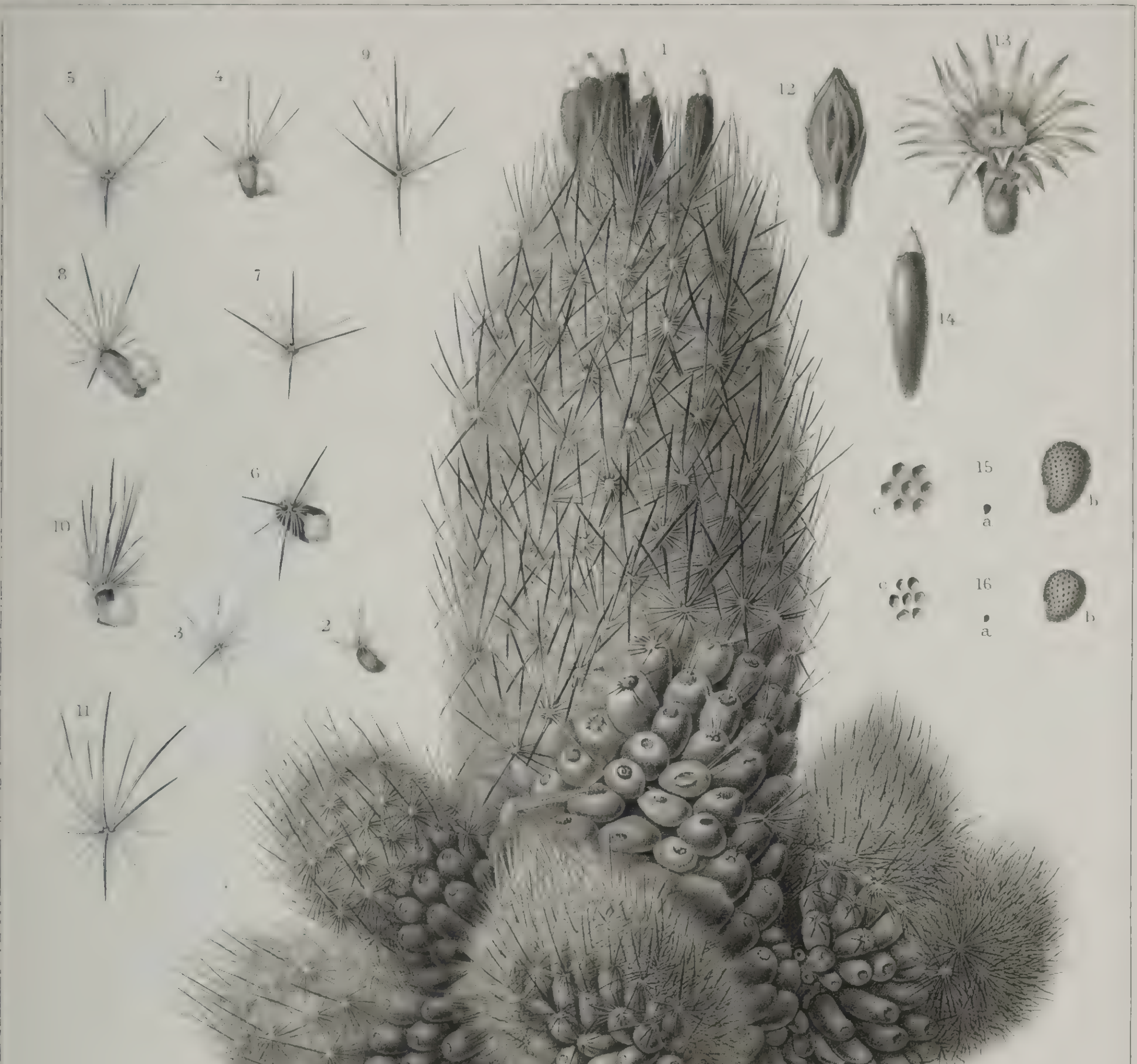
P Roetter del W.H.Dougal sc.

MAMILLARIA ECHINUS



[illegible] del. [illegible] A. Maillard scs

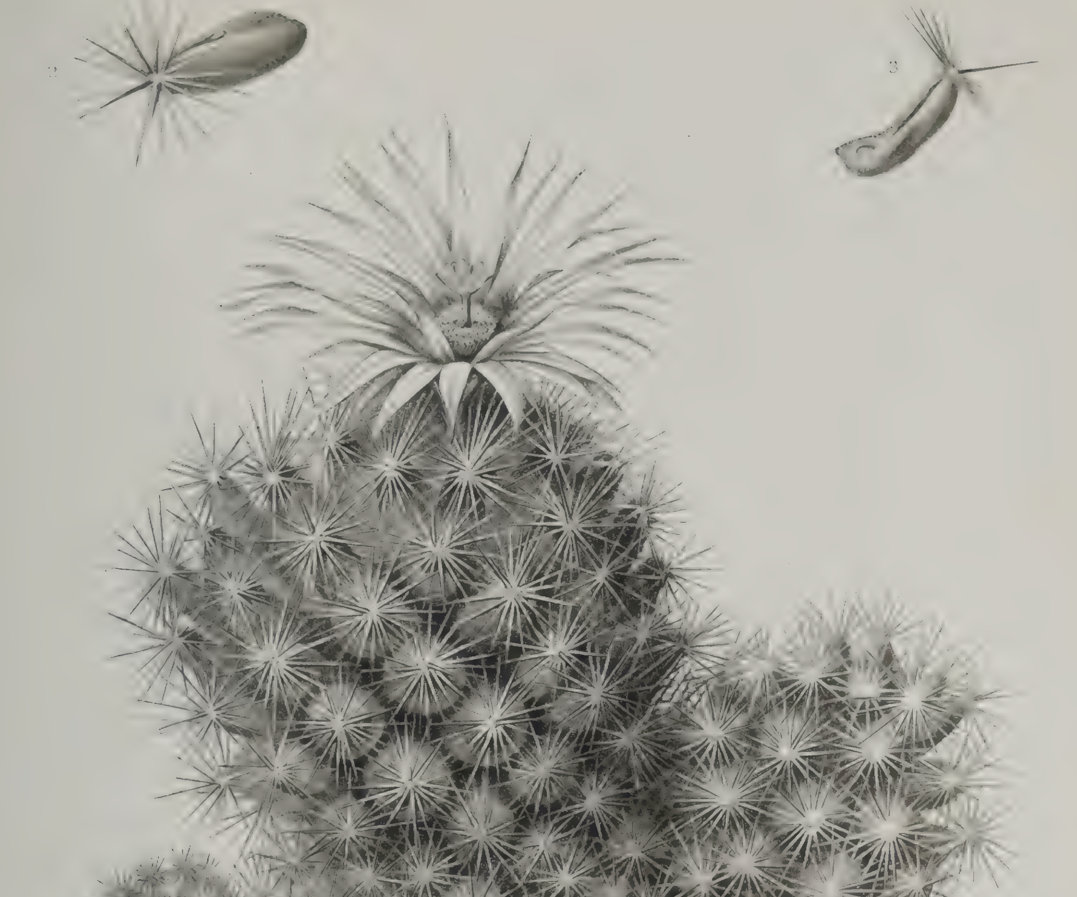
MAMILLARIA PECTINATA E.



Picart sc

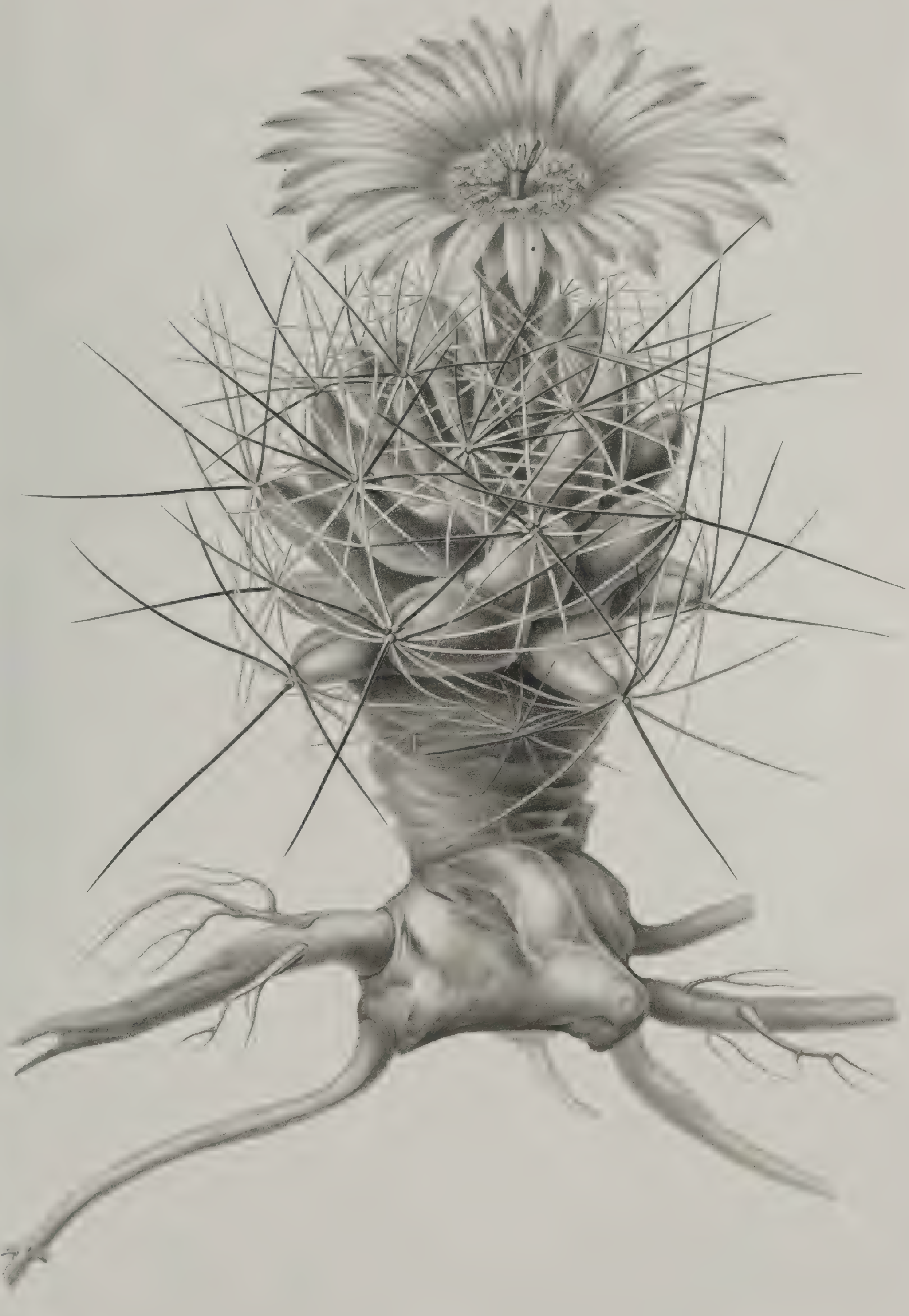
1-16 MAMILLARIA TUBERCULOSA

17-22 " DASYACANTHA



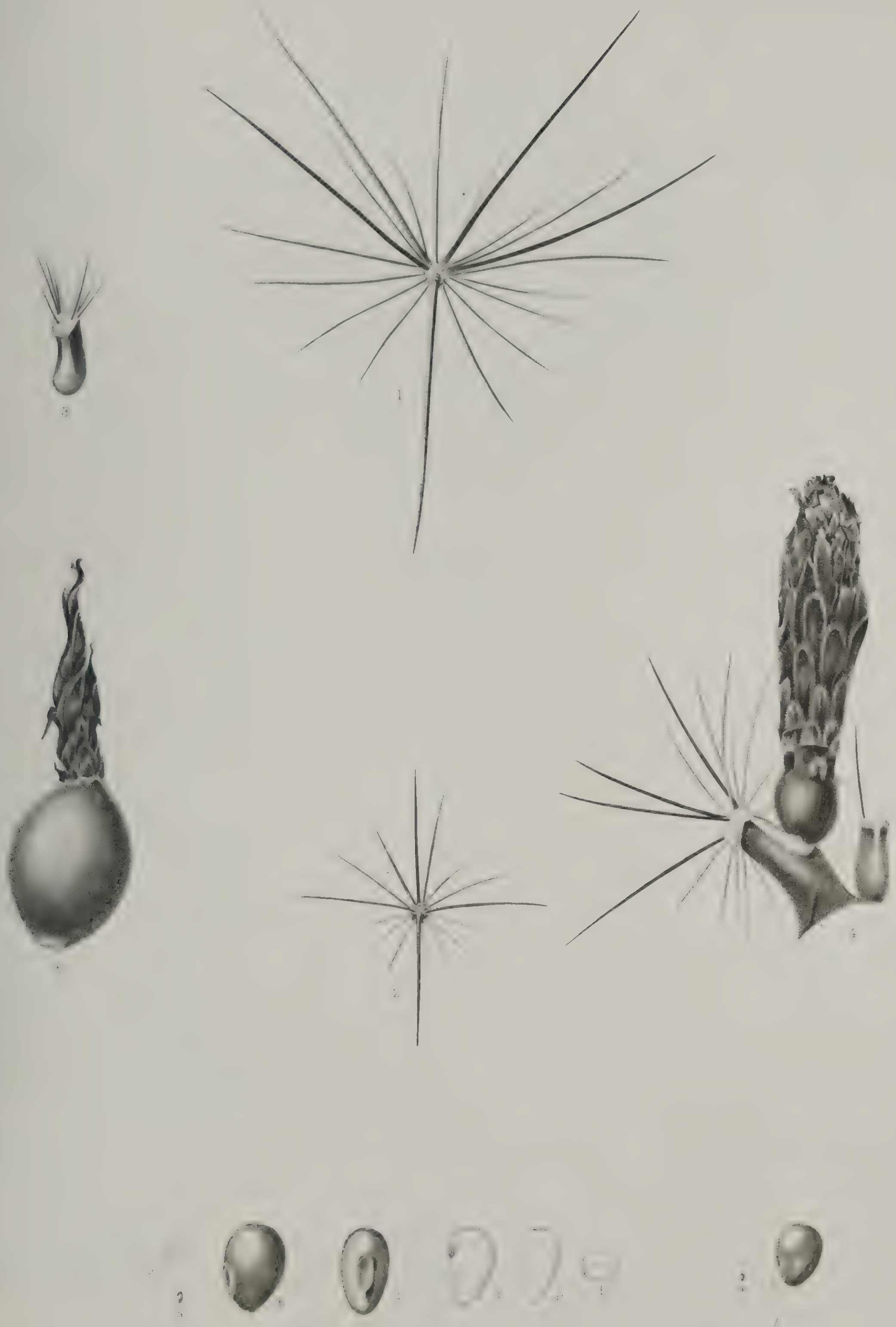
F Roetter del. W H Dougal sc

MAMILLARIA RADIOSA VAR NEOMEXICANA

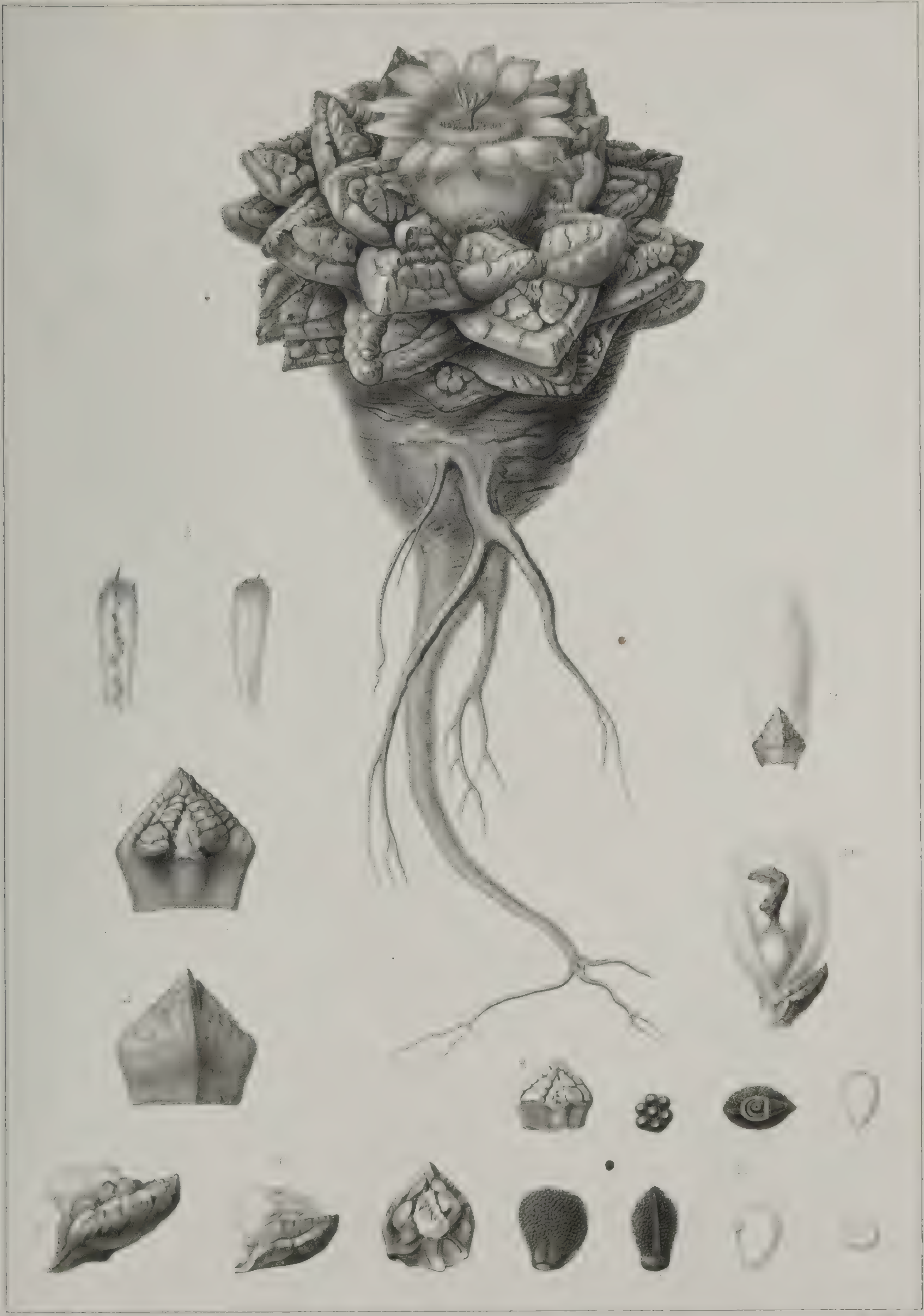


[illegible] [illegible]

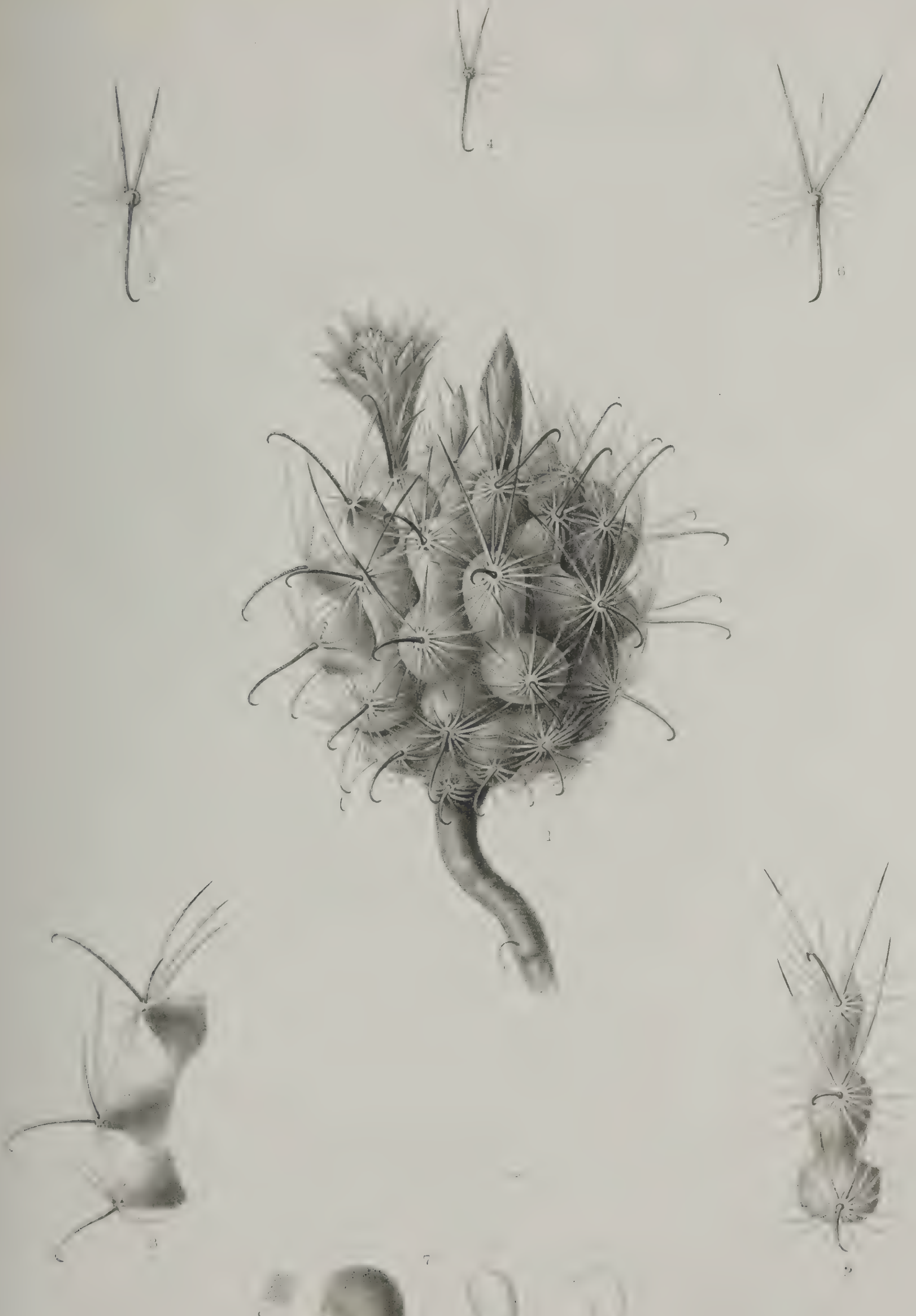
MAMILLARIA MACROMERIS



MAMILLARIA MACROMERIS

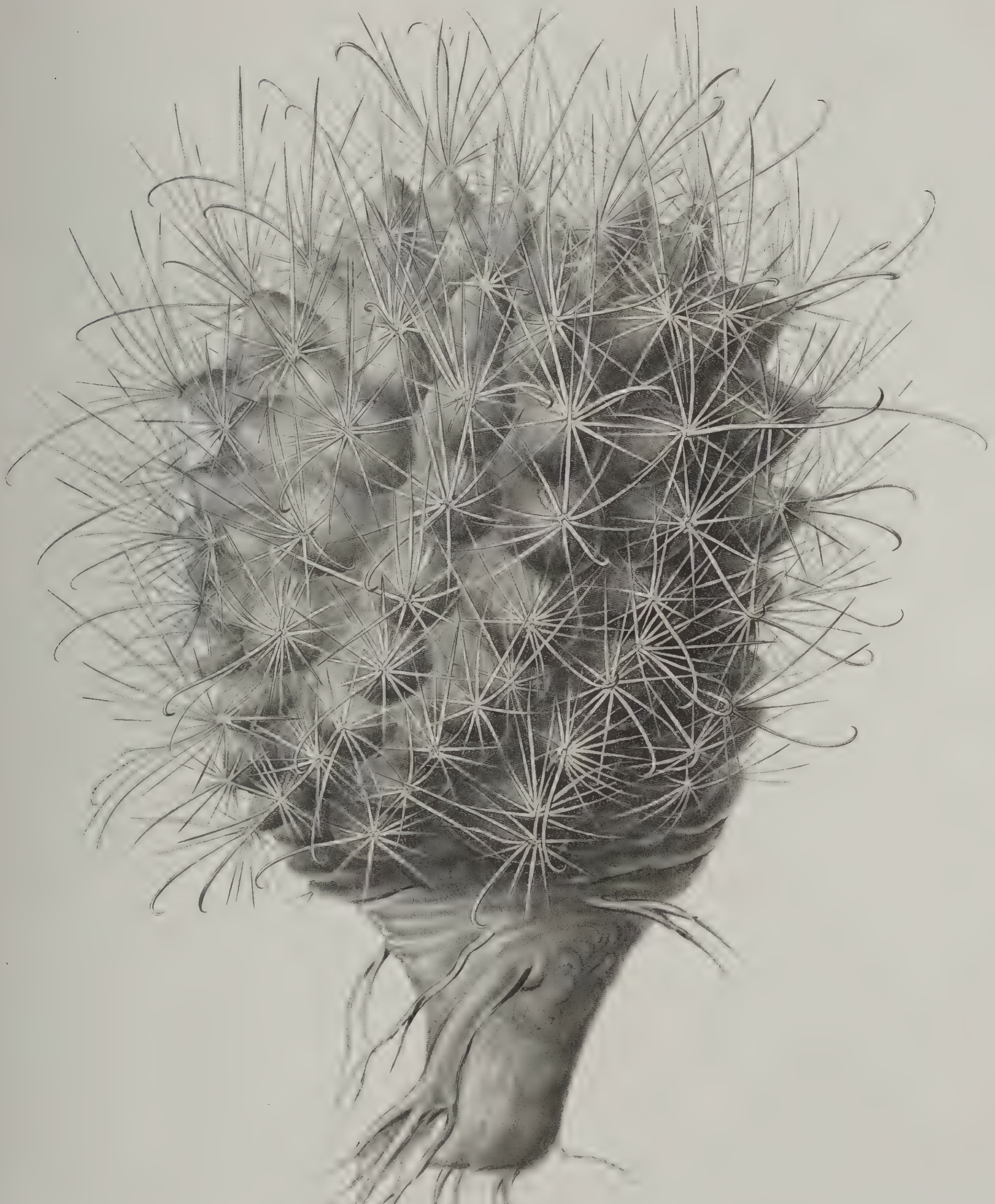


MAMILLARIA FISSURATA



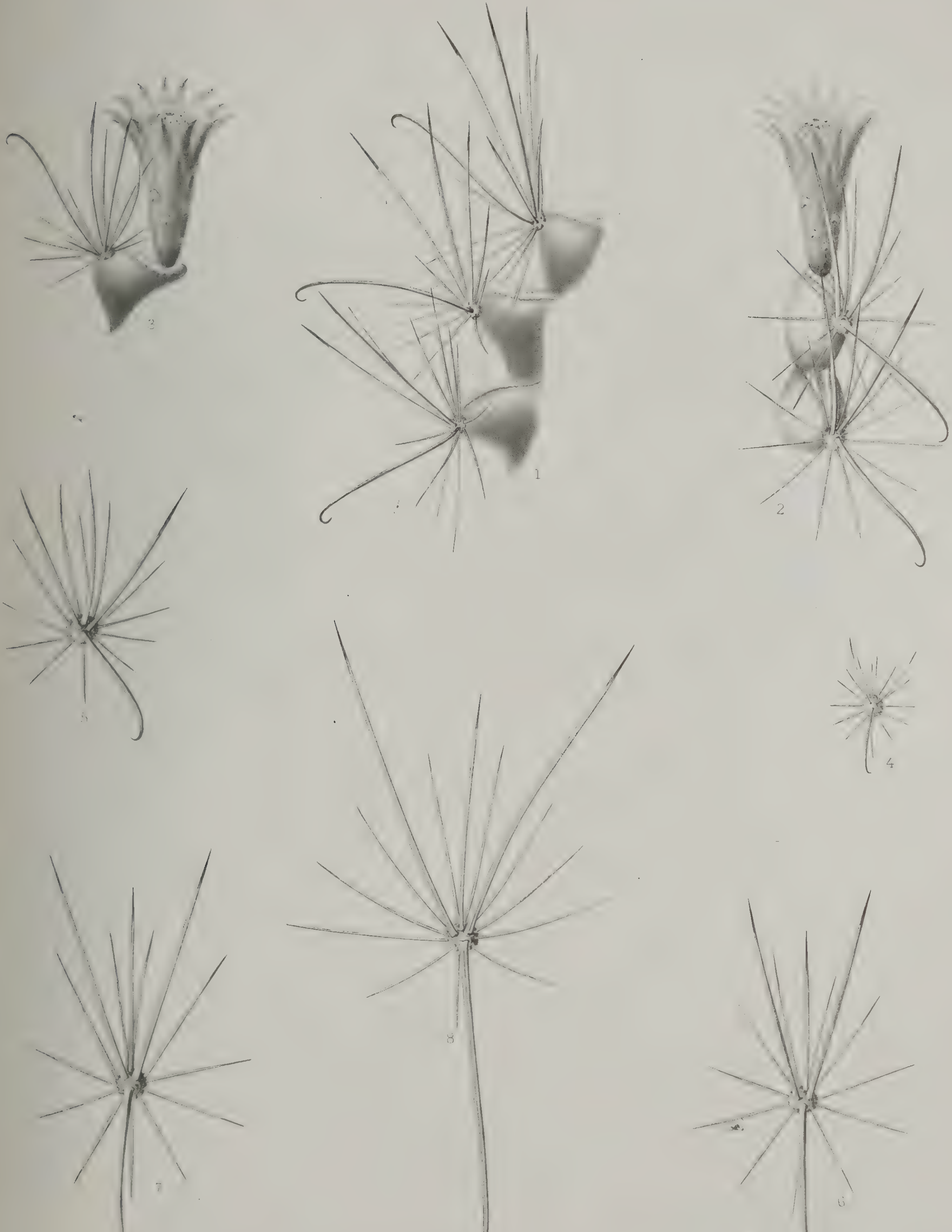
Dougal sc.

ECHINOCACTUS SCHEERII



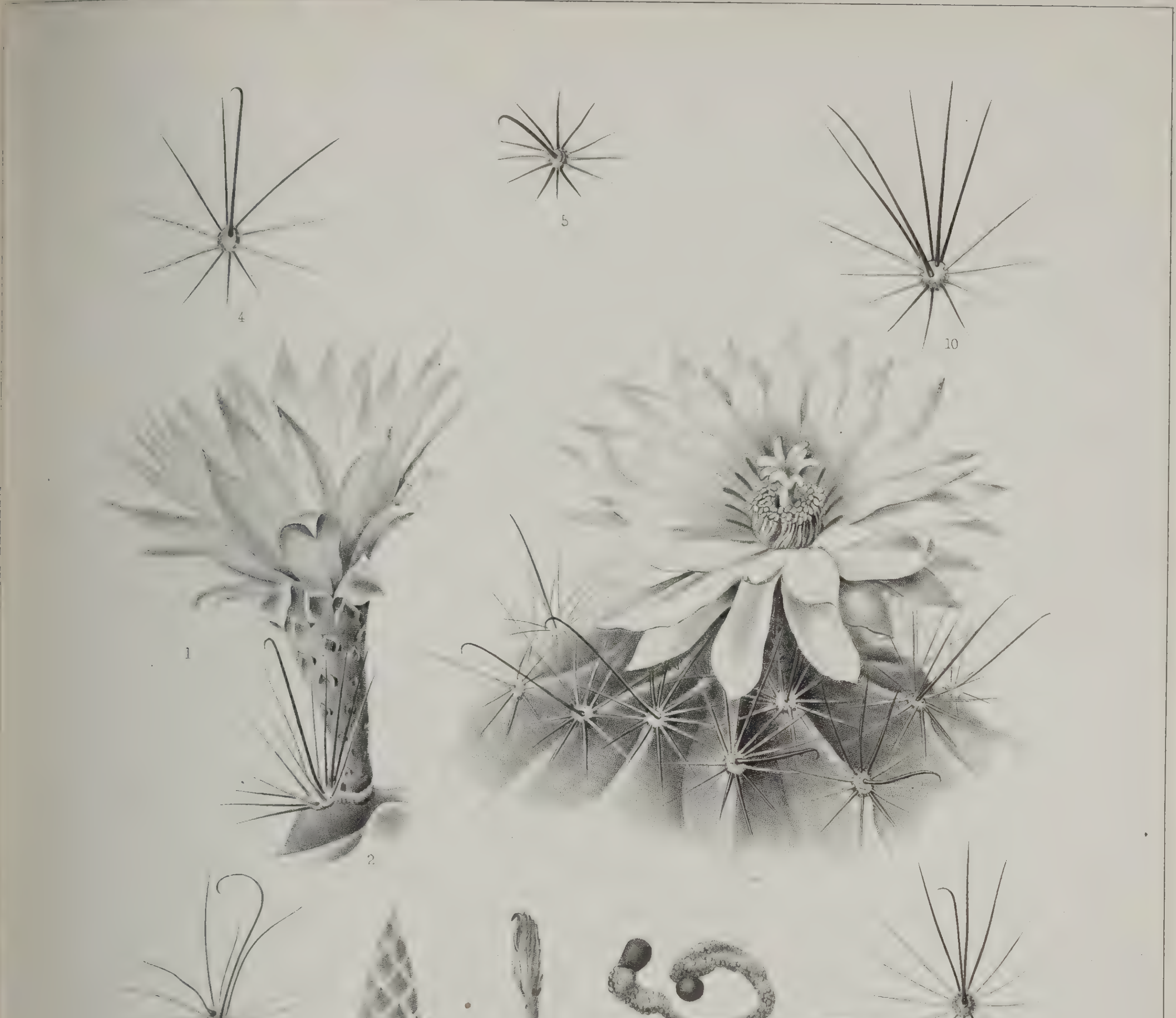
W H Dougal sc

ECHINOCACTUS BREVIHAMATUS



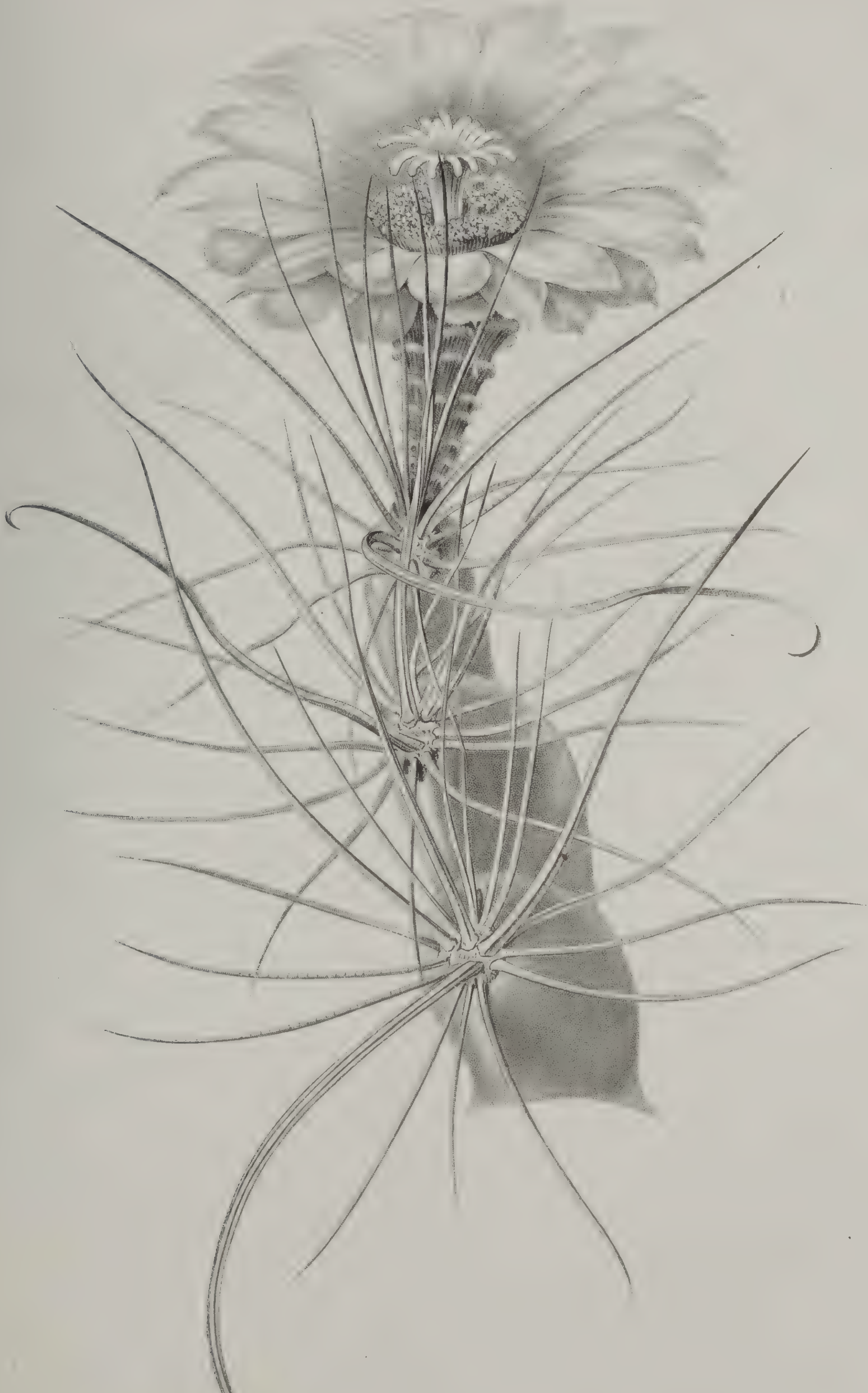
W. H. Dougal sc.

ECHINOCACTUS BREVIHAMATUS



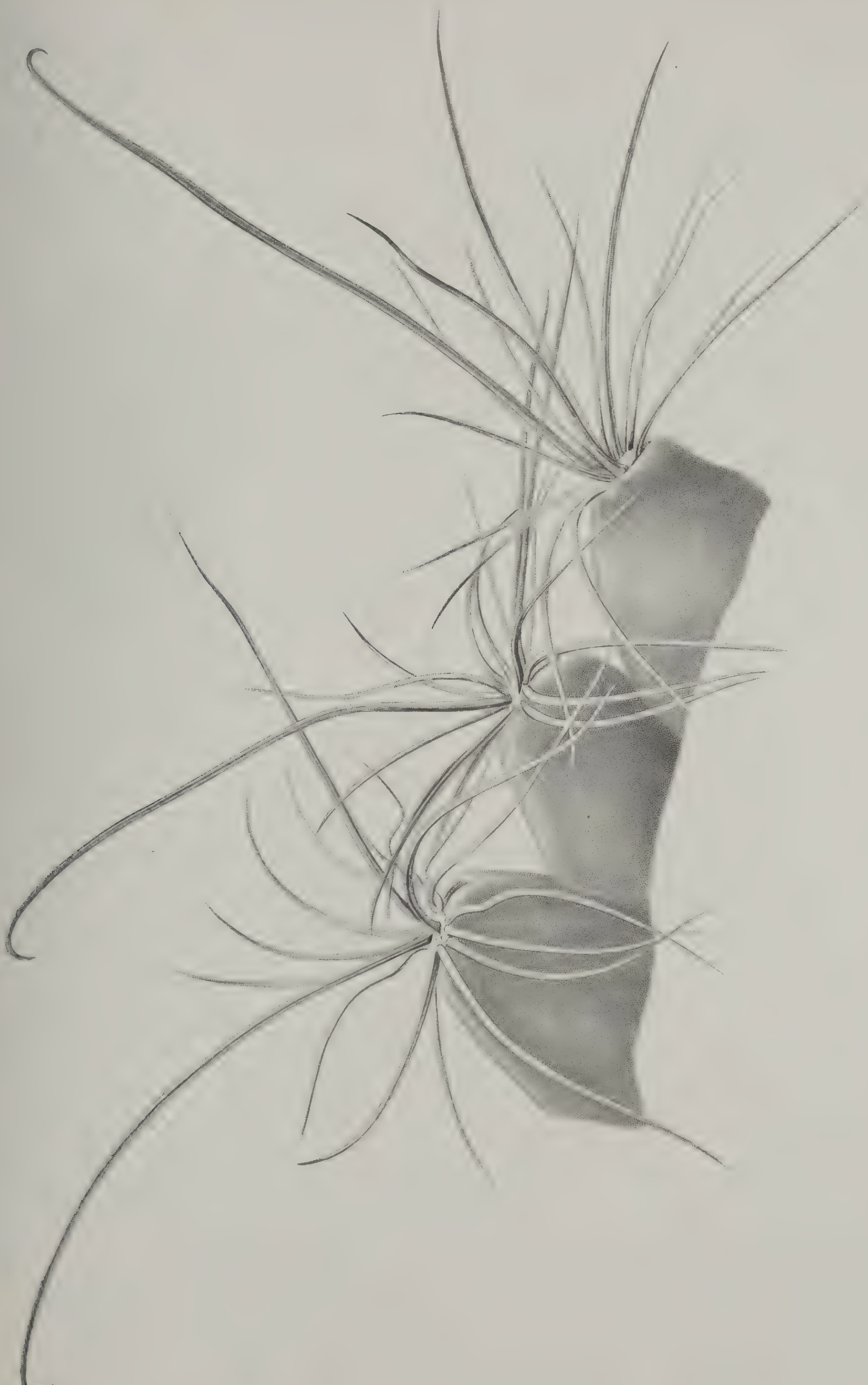
P. Roetter del. W.H. Dougal sc.

ECHINOCACTUS SETISPINUS



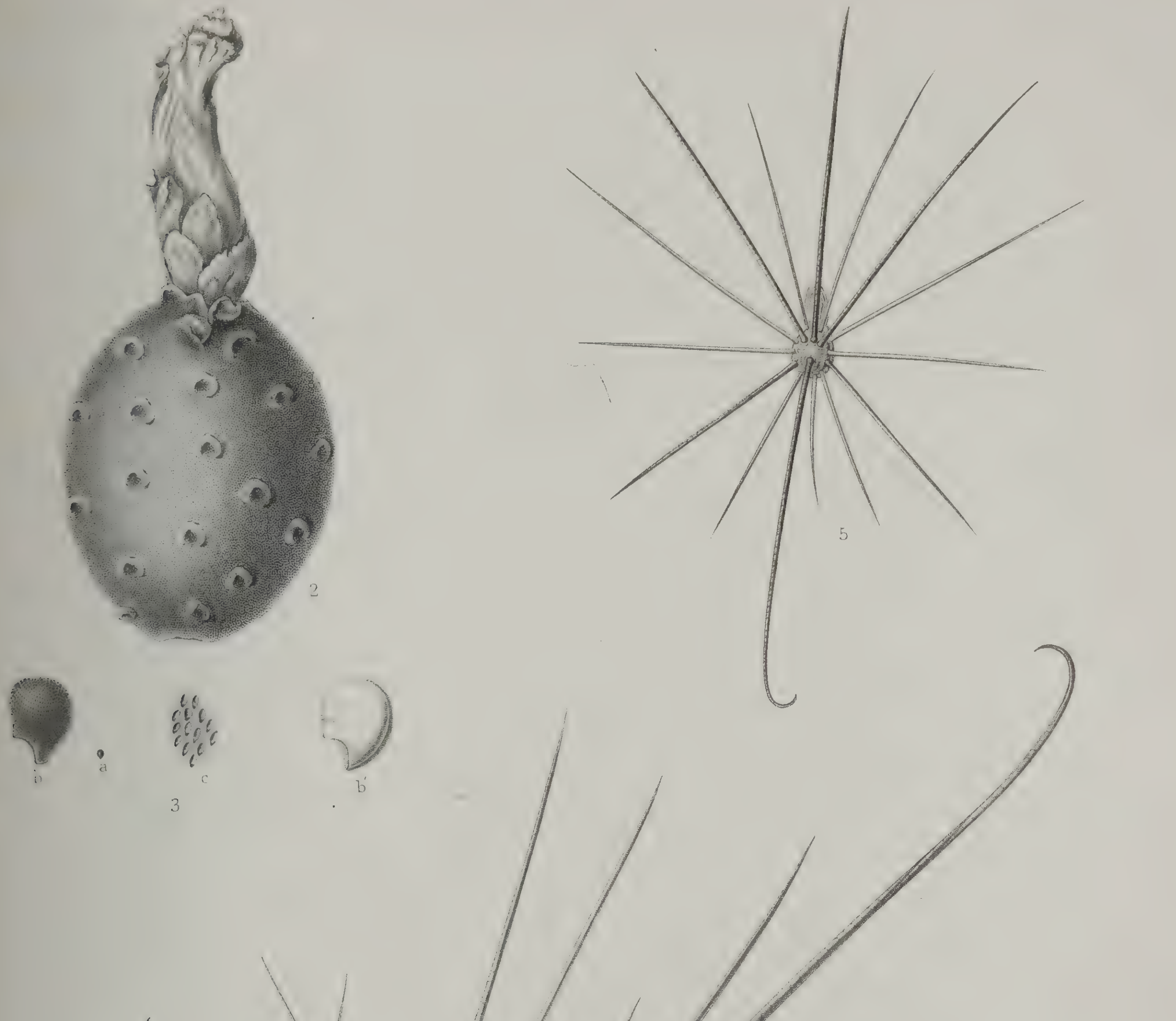
Dougal sc.

ECHINOCACTUS LONGEHAMATUS



[illegible] del. Dougal Sc.

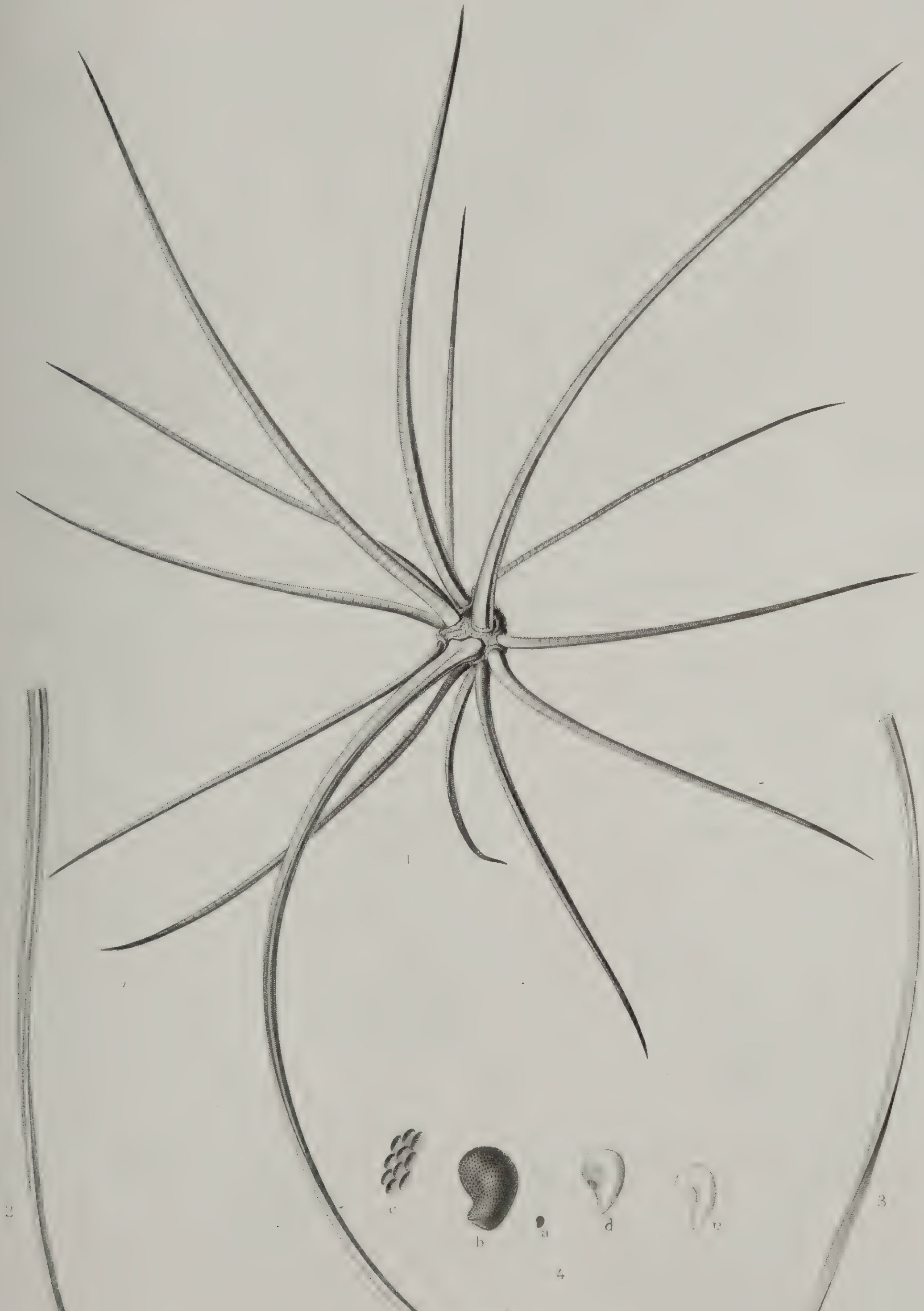
ECHINOCACTUS LONGEHAMATUS



P. Roetter del.

Dougal sc.

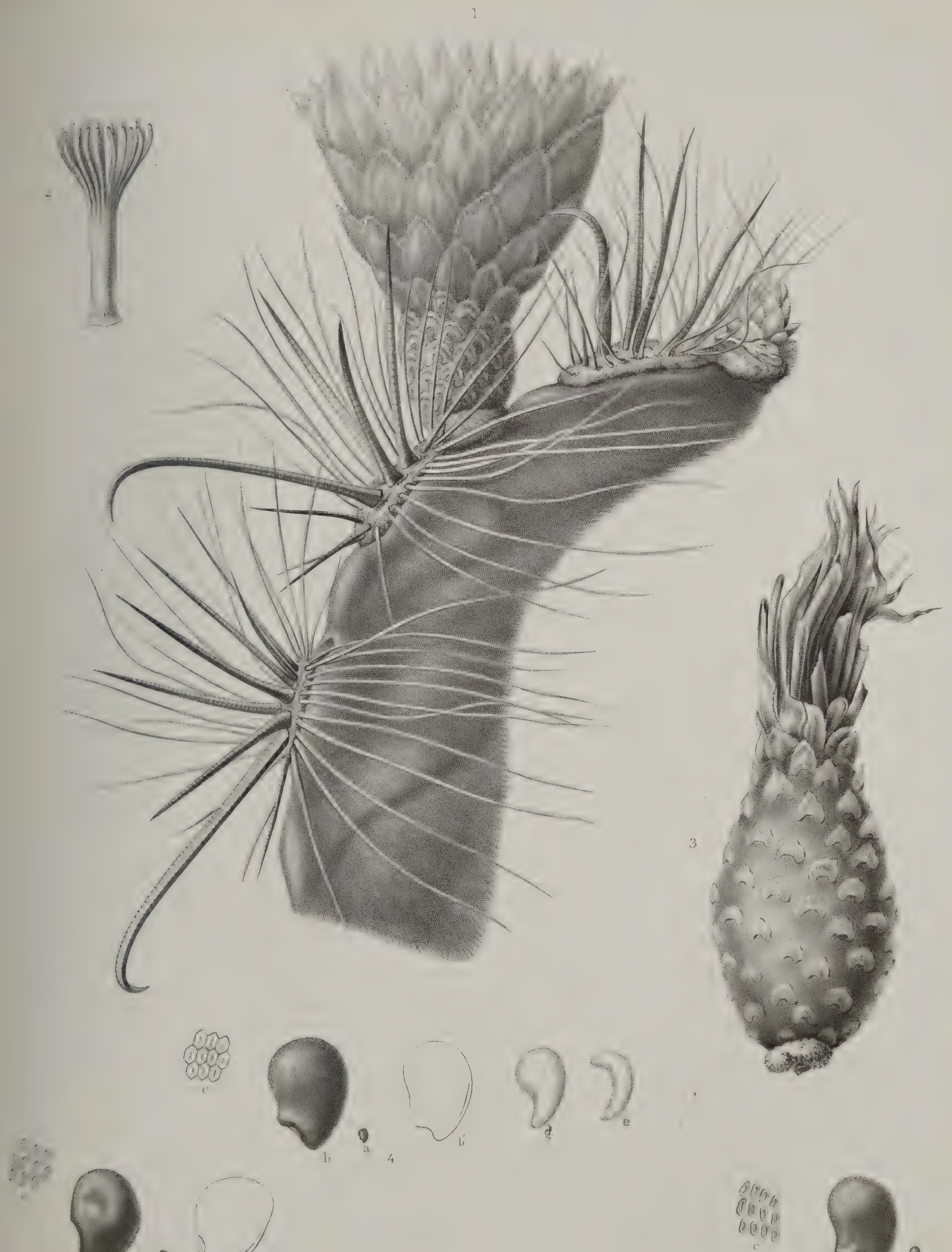
ECHINOCACTUS LONGEHAMATUS



[illegible]

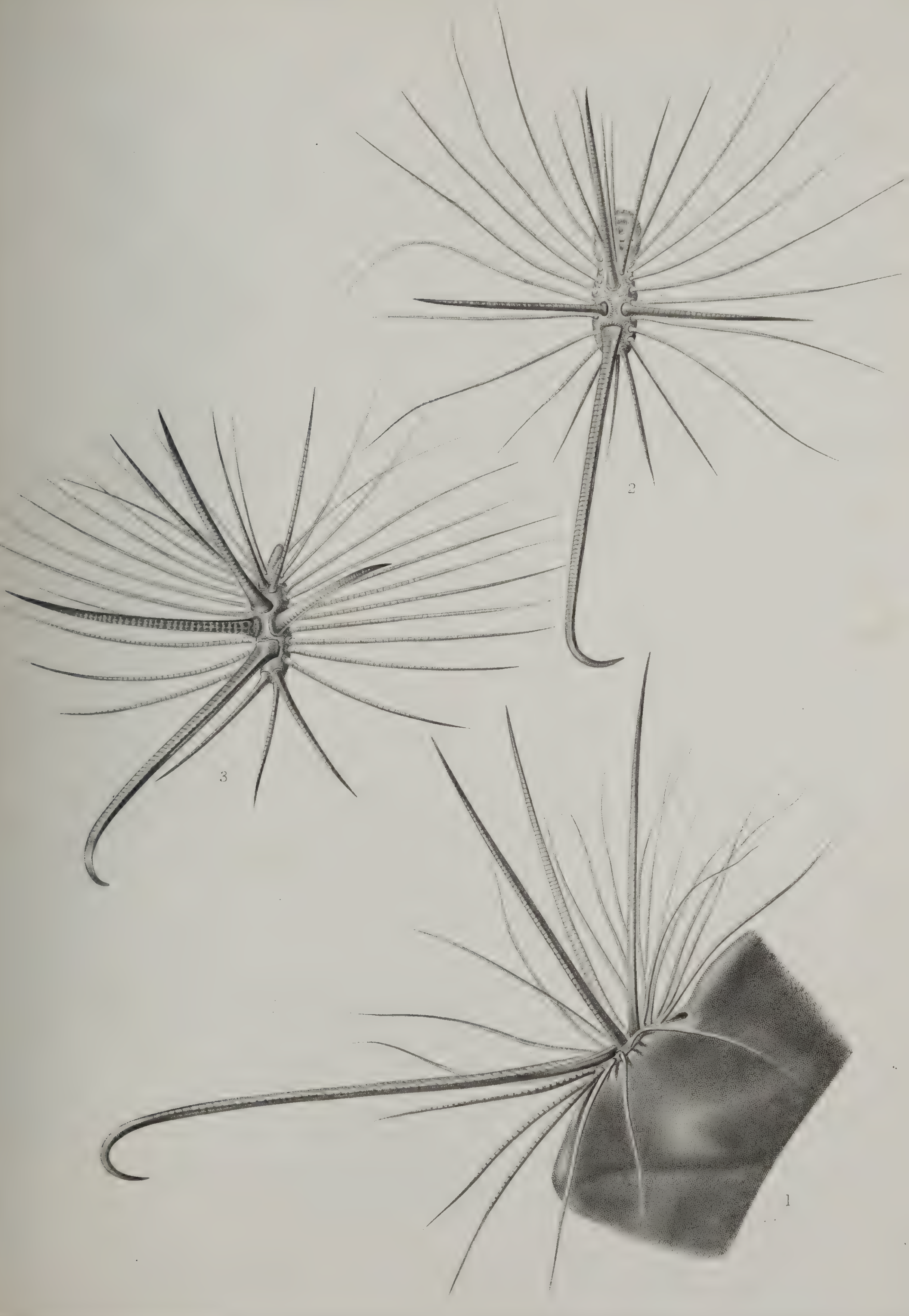
Dougal sc.

ECHINOCACTUS LONGEHAMATUS



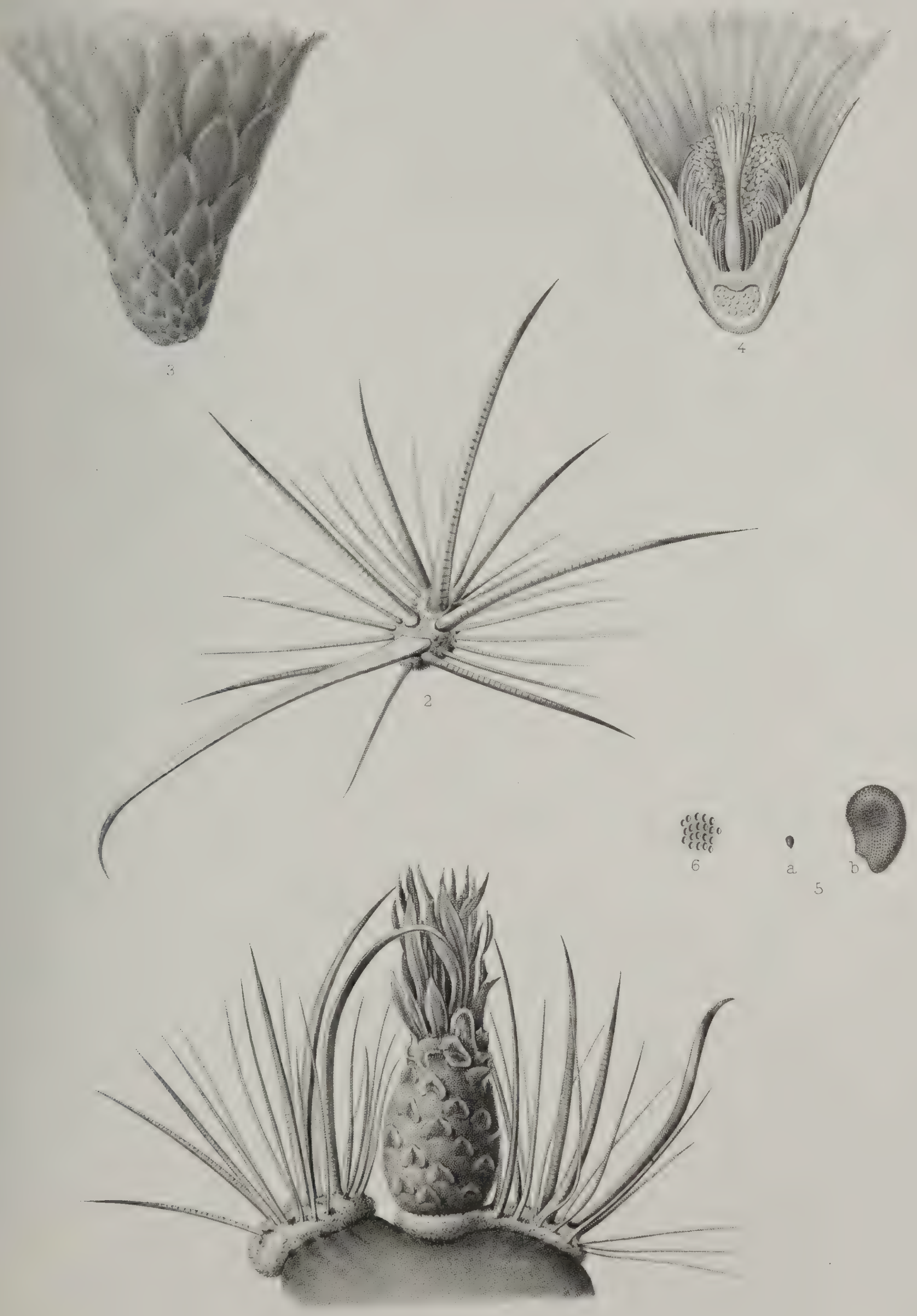
W. H. Dougal sc.

ECHINOCACTUS WISLIZENI



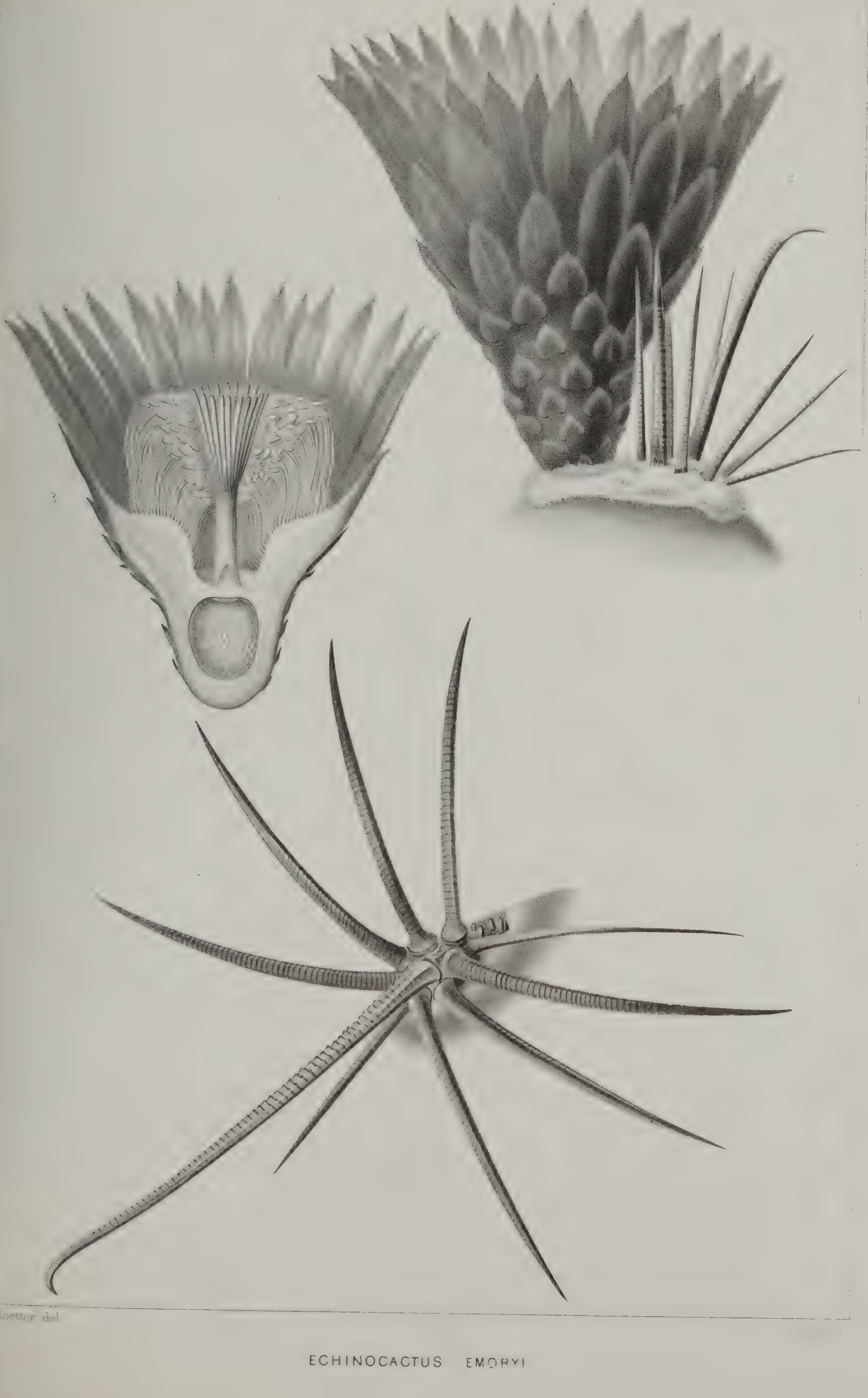
etter del. W.H. Dougal sc.

ECHINOCACTUS WISLIZENI



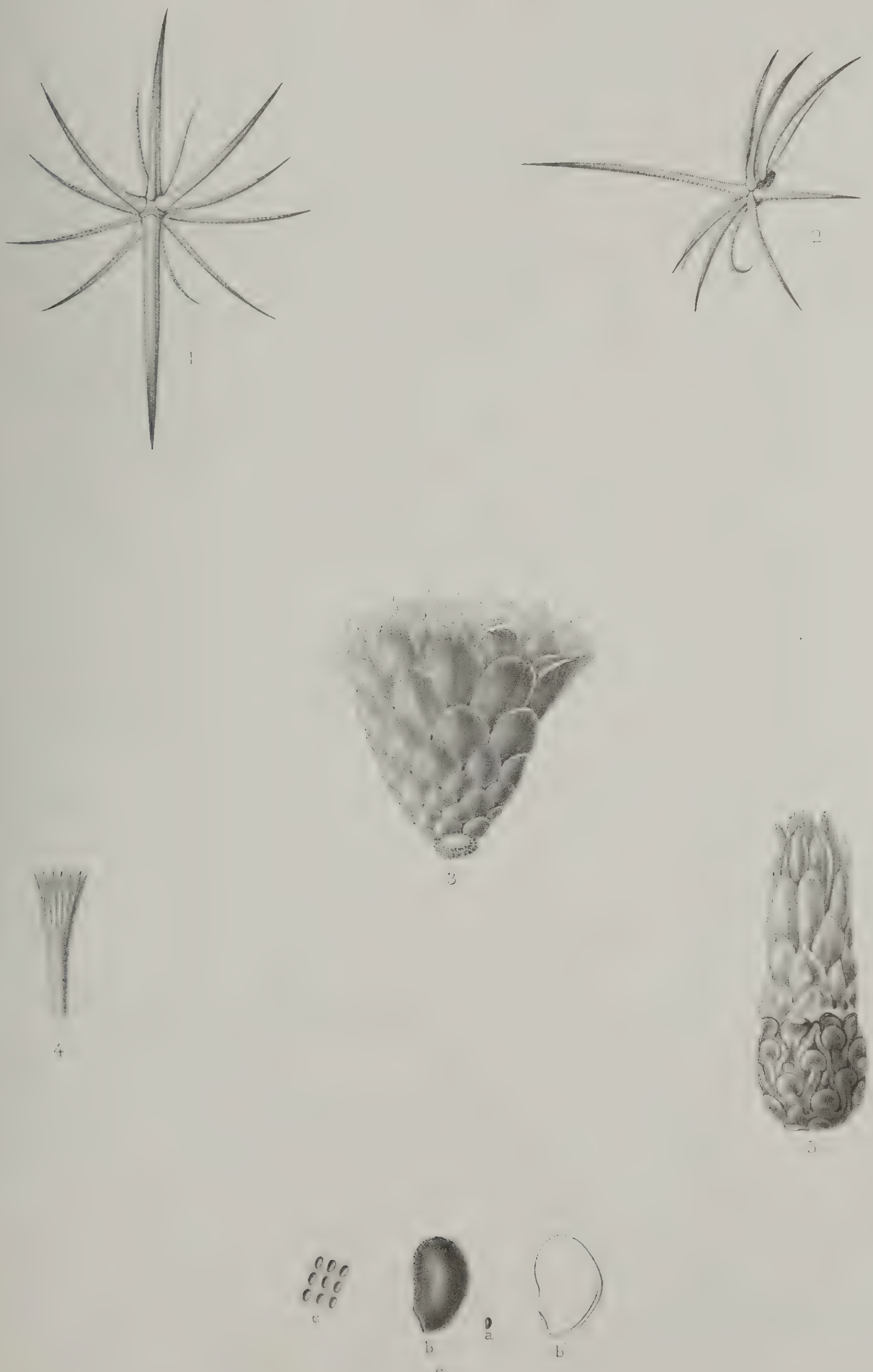
W H Dougal sc

ECHINOCACTUS LE CONTEI

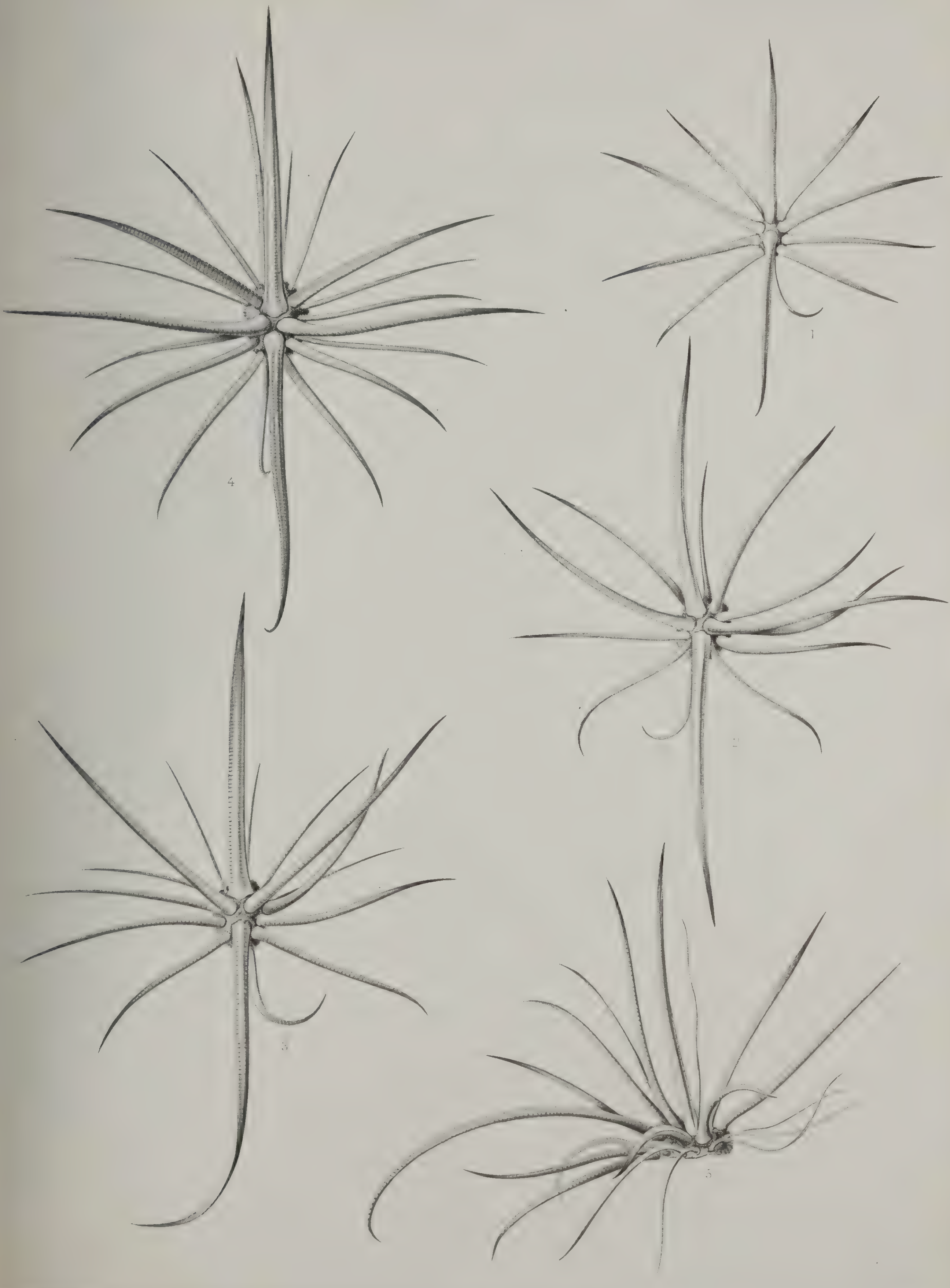


P Roetter del

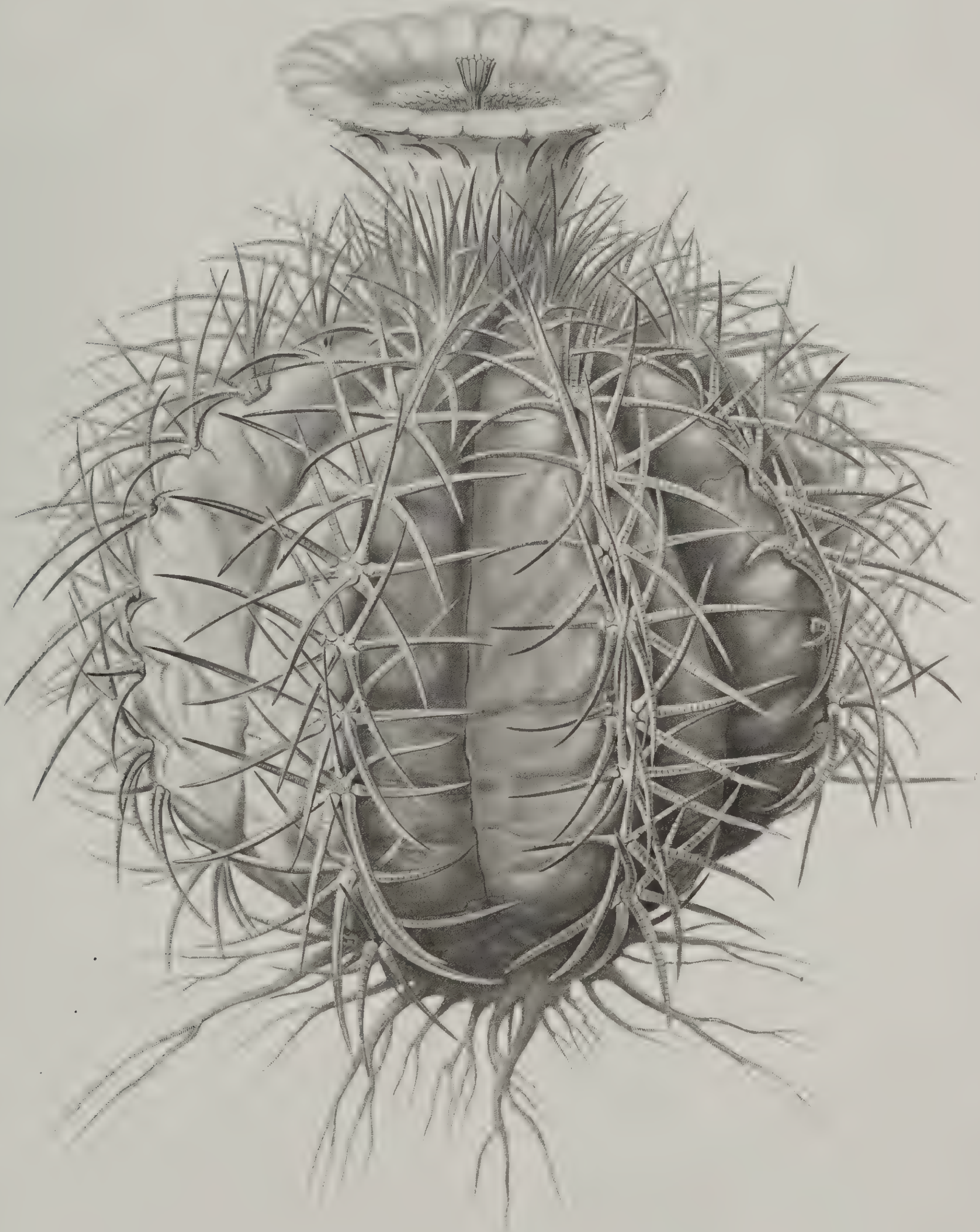
ECHINOCACTUS EMORYI



ECHINOCACTUS VIRIDESCENS



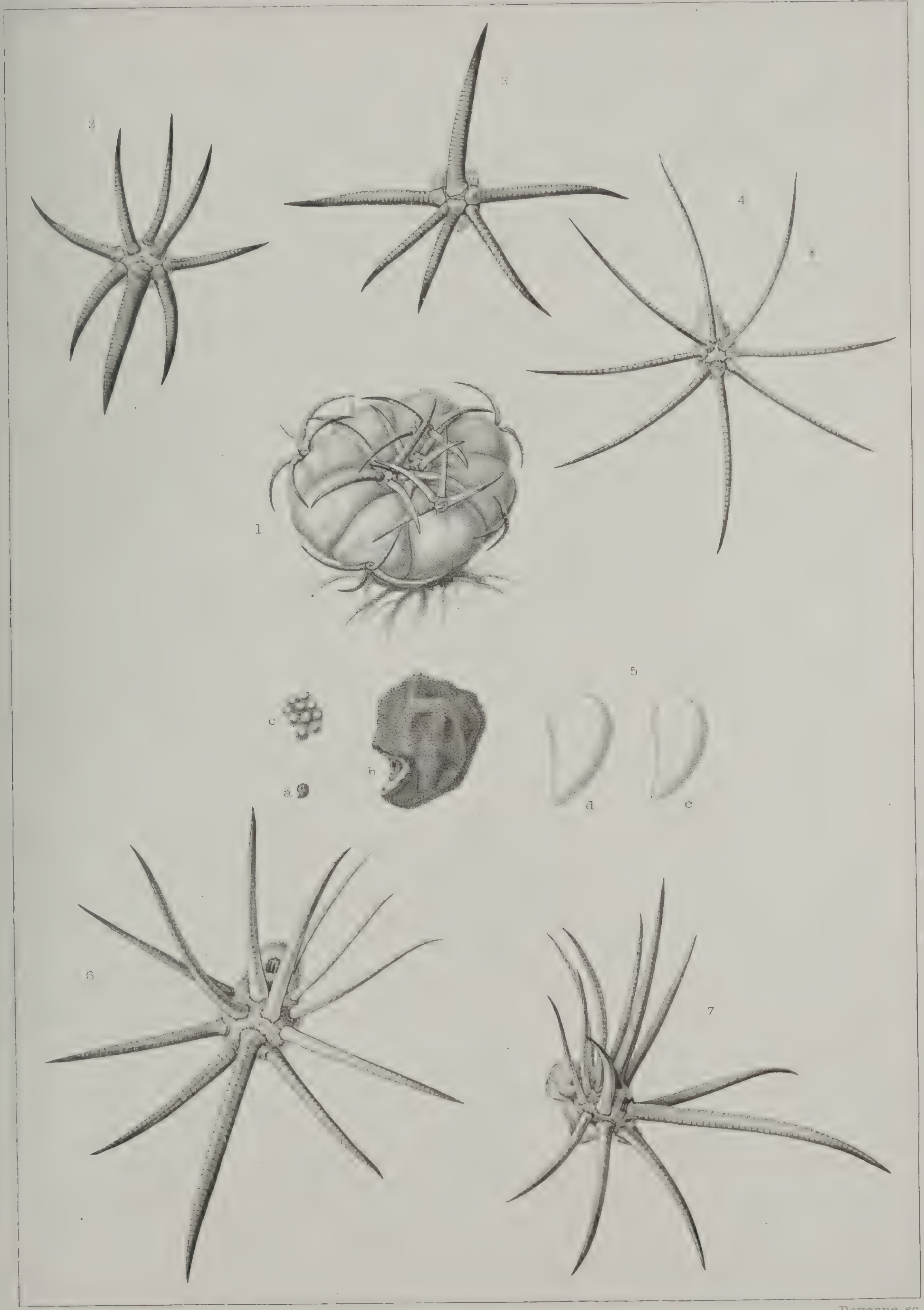
ECHINOCACTUS CYLINDRACEUS



F.Roetter del

Dougal sc

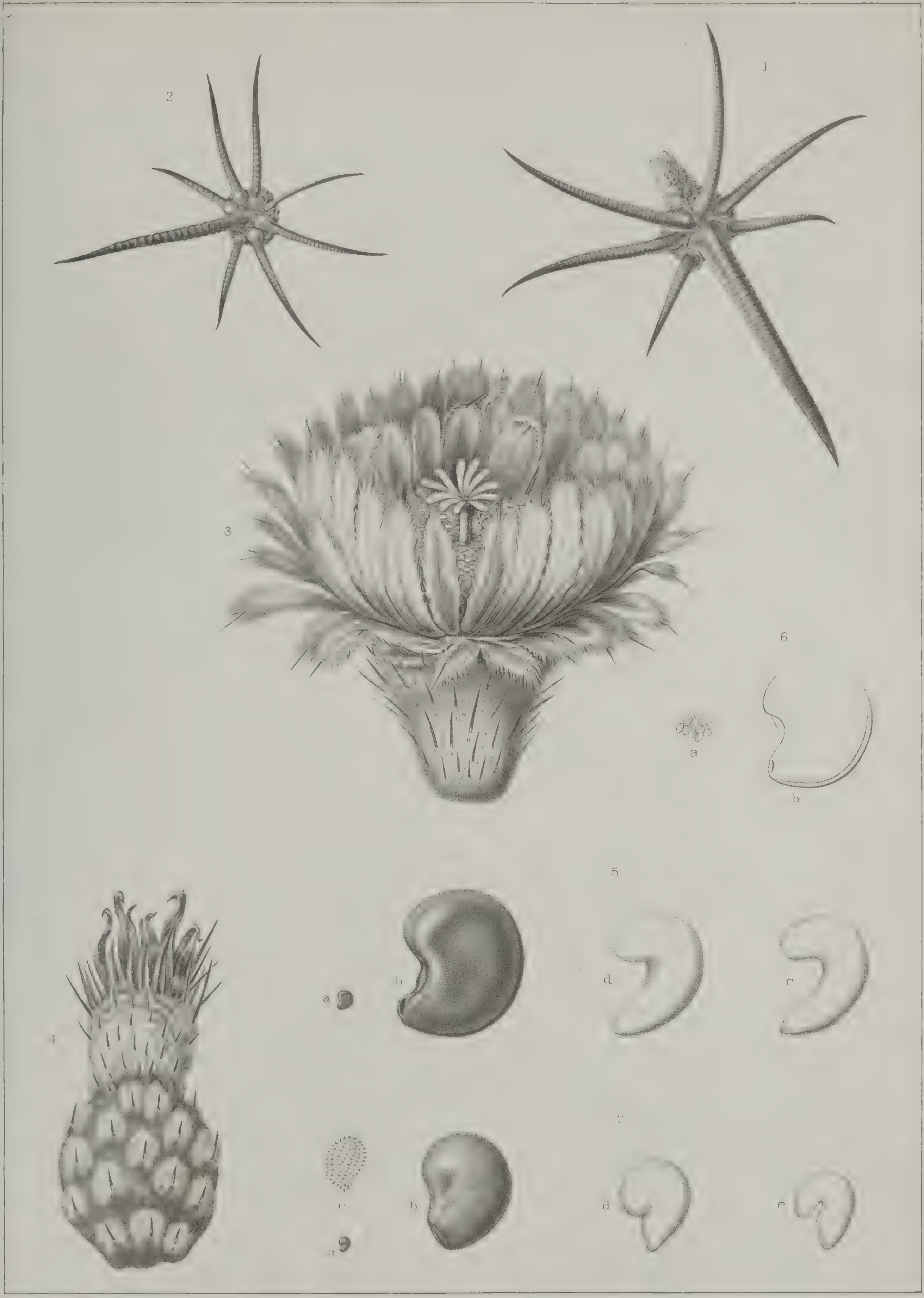
ECHINOCACTUS HORIZONTHALONIUS



P. Roetter del. Davesne sc.

1-5 ECHINOCACTUS HORIZONTHALONIUS

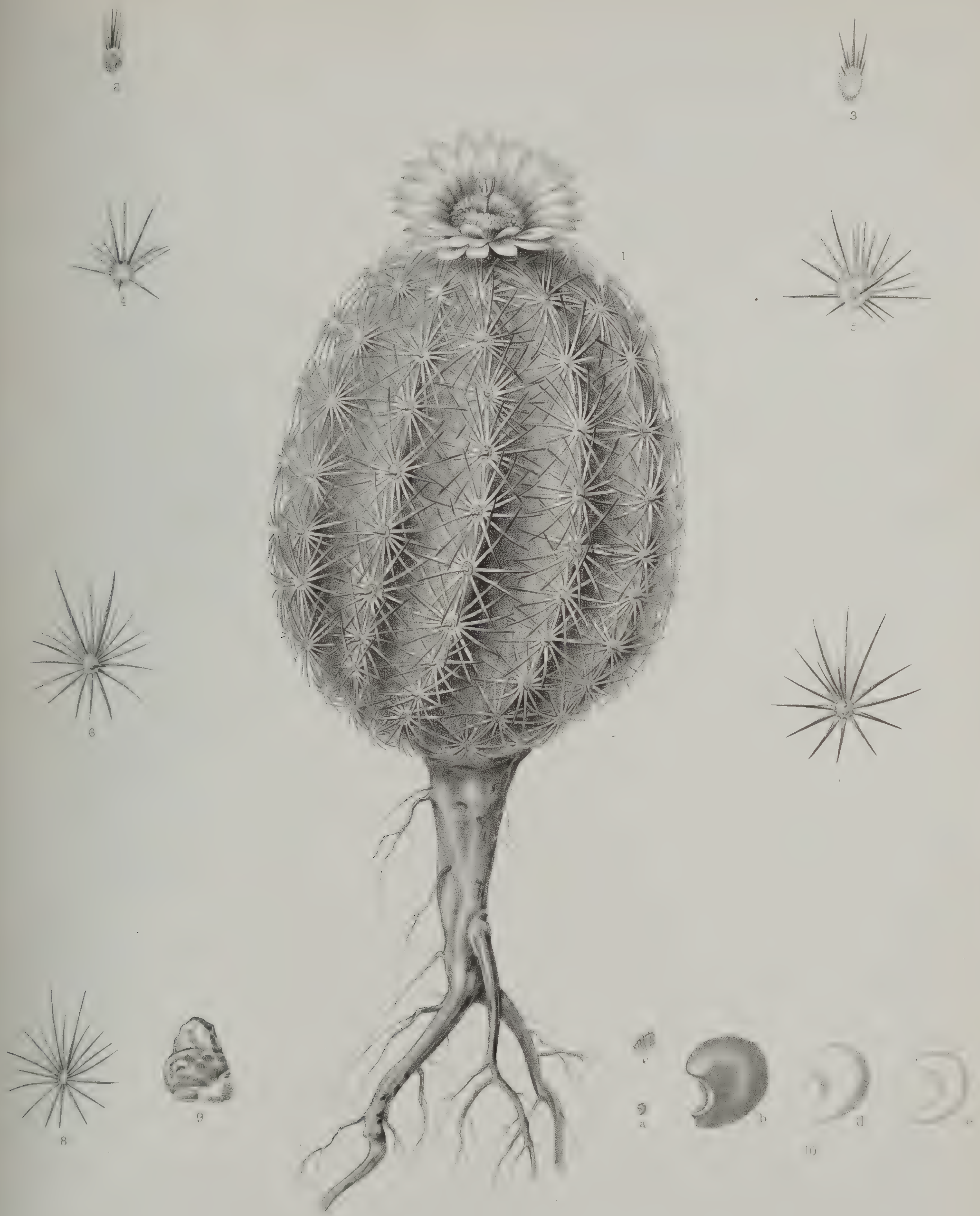
6-7 ECHINOCACTUS PARRYI



P. Roetter del. Davesne sc.

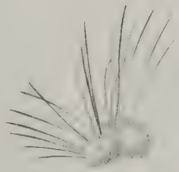
1–6 ECHINOCACTUS TEXENSIS

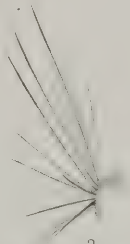
7 ECHINOCACTUS SANDILLON

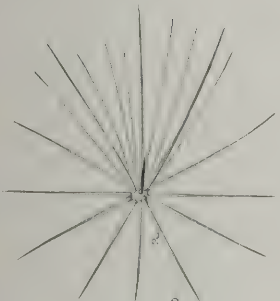


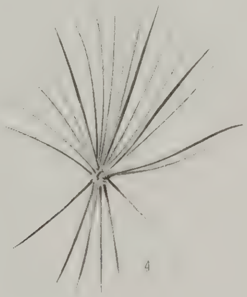
W.H.Dougal sc.

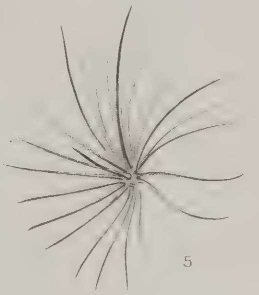
ECHINOCACTUS INTERTEXTUS

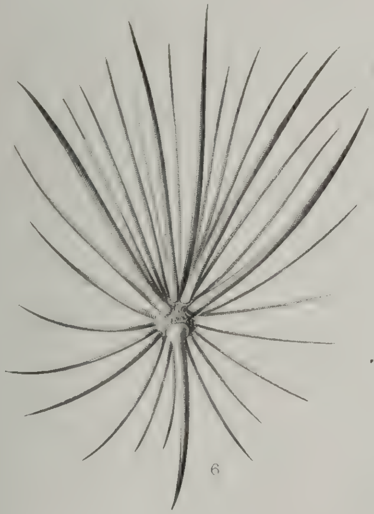

1

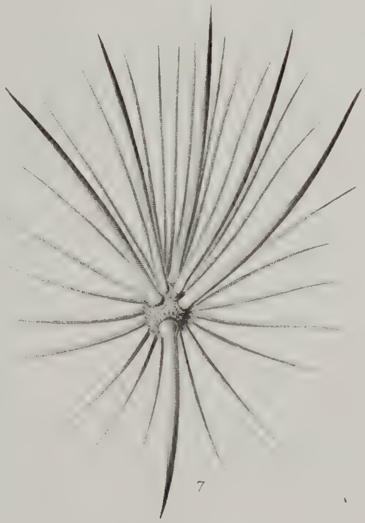

2

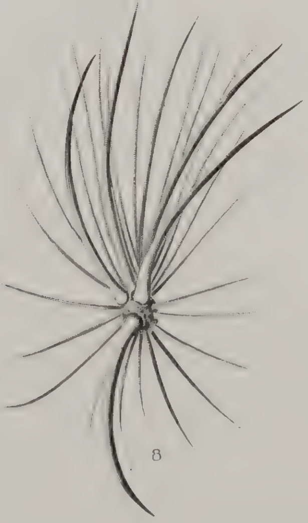

3


4


5


6

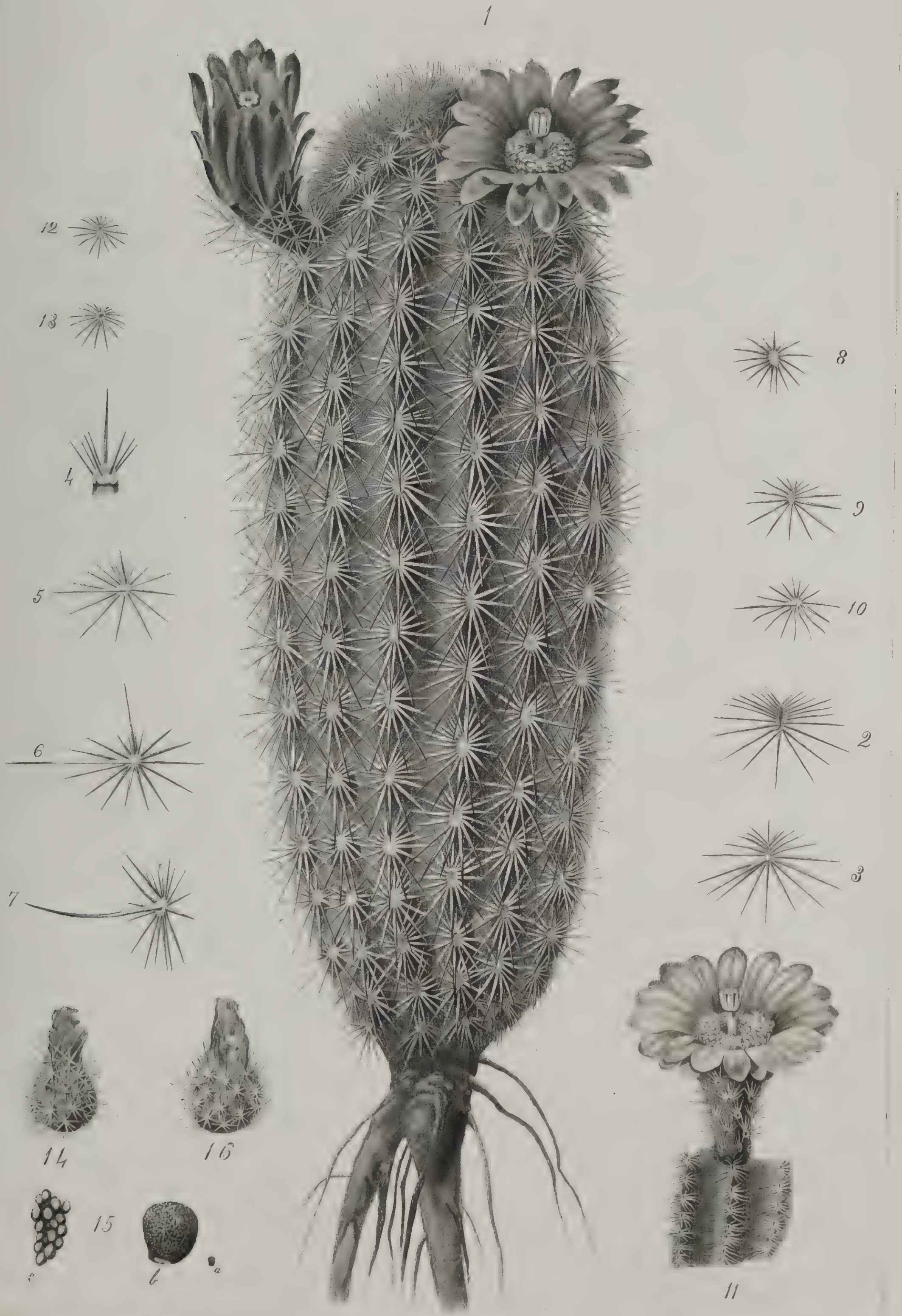

7


8

[illegible] del.

W.H.Dougal sc.

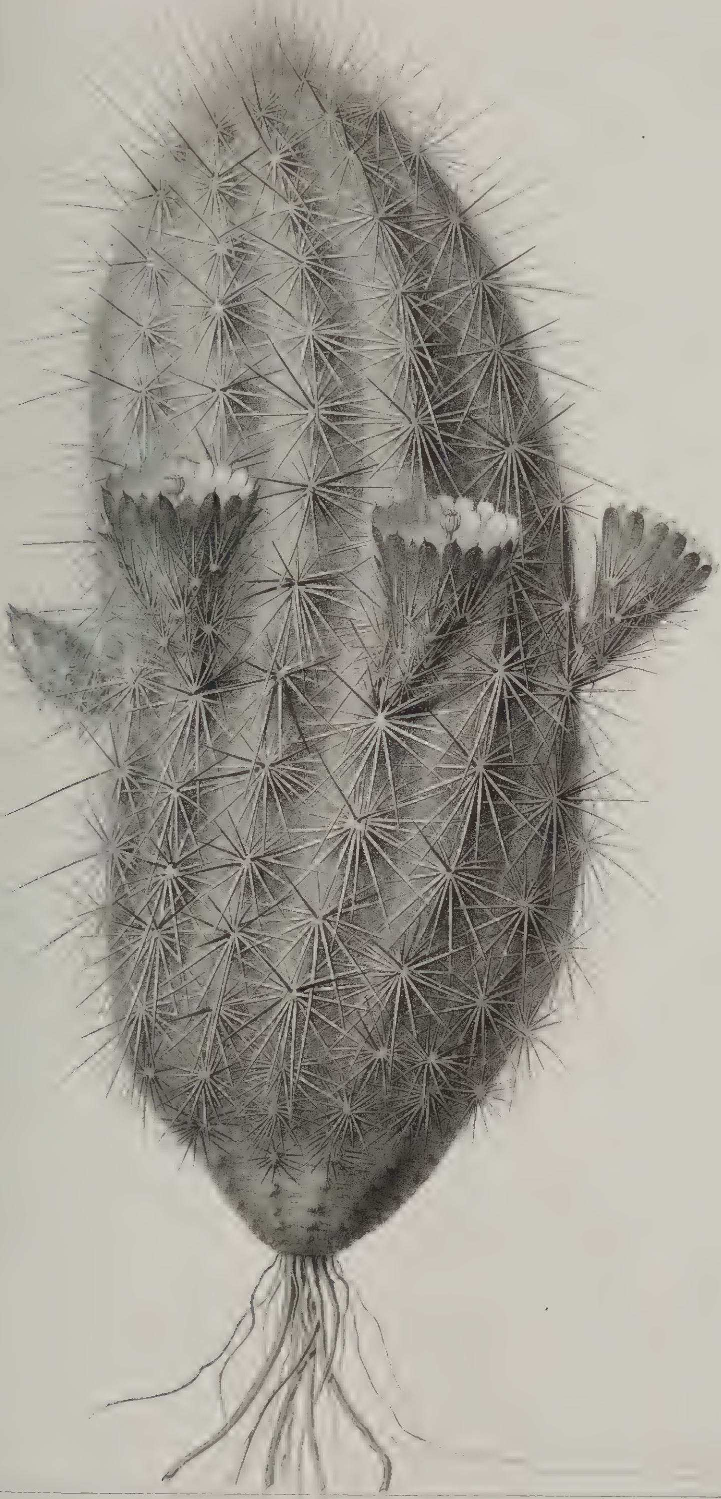
1 5 ECHINOCACTUS INTERTEXTUS VAR. DASYACANTHUS 6 8 ECHINOCACTUS UNGUISPINUS



PAULUS ROETTER DEL.

A. CONRAD ENG. ST LOUIS MO.

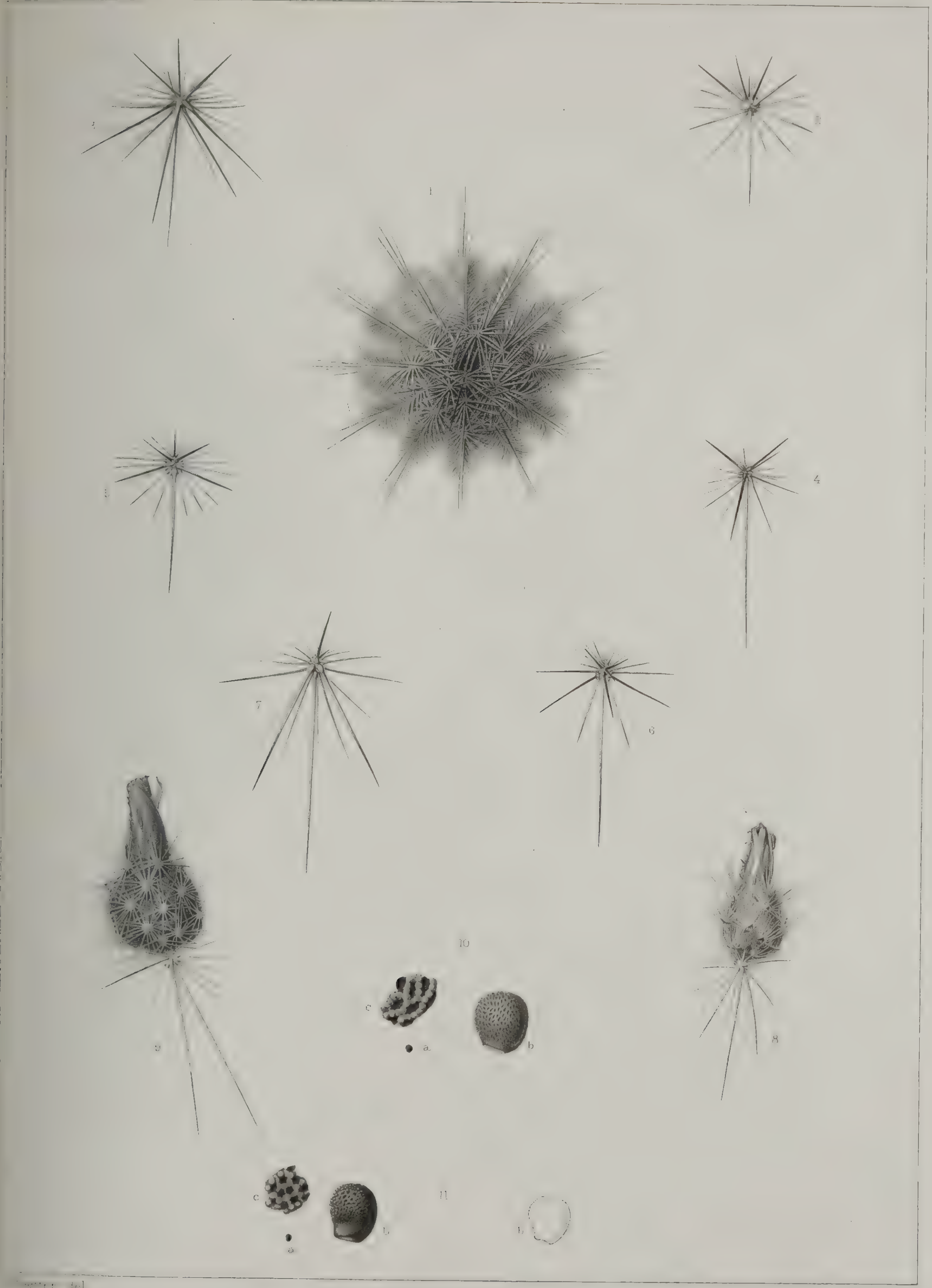
CEREUS VIRIDIFLORUS



P. Roetter del.

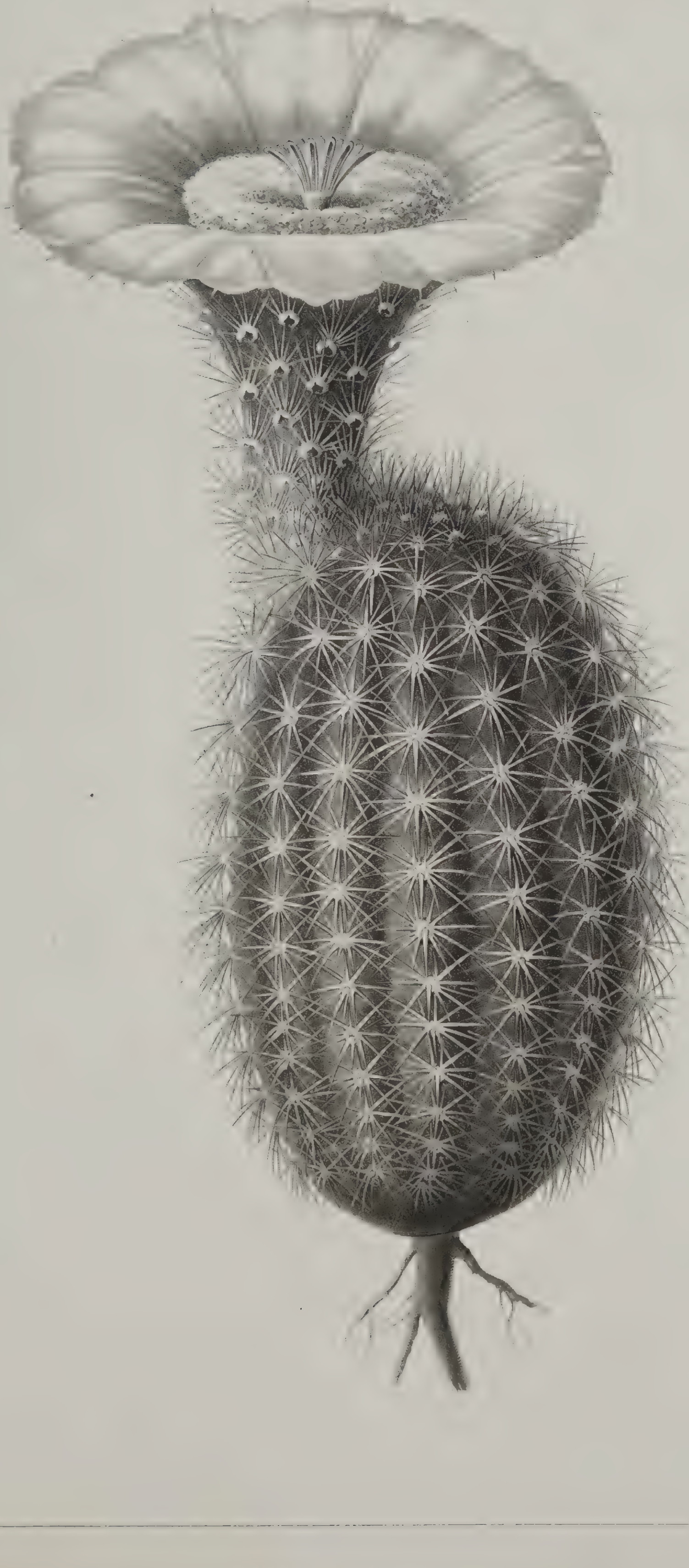
Picart sc.

CEREUS CHLORANTHUS



[illegible] del Picart sc

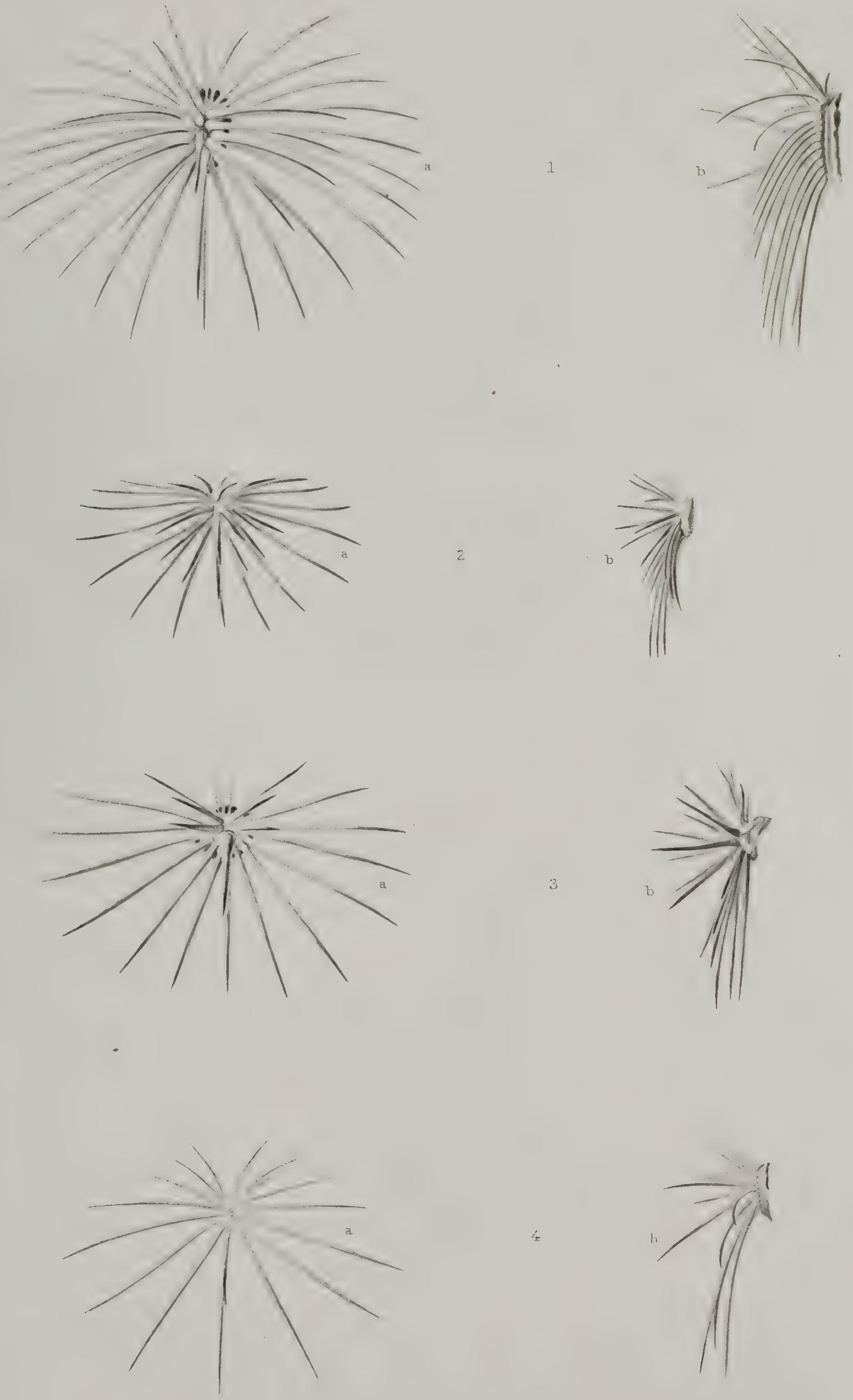
CEREUS CHLORANTHUS



P.Roetter del.

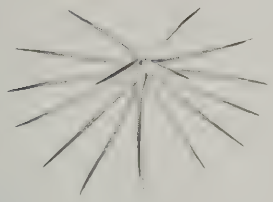
Dougal sc.

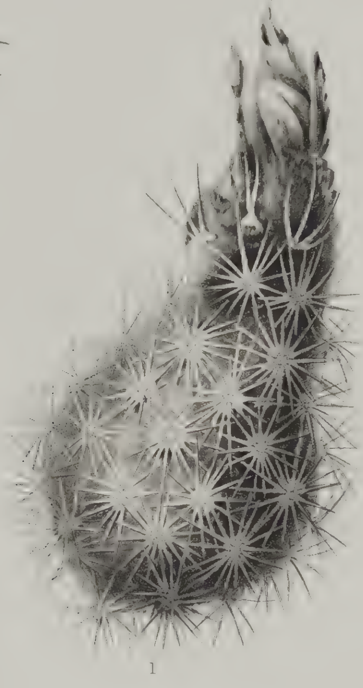
CEREUS DASYACANTHUS



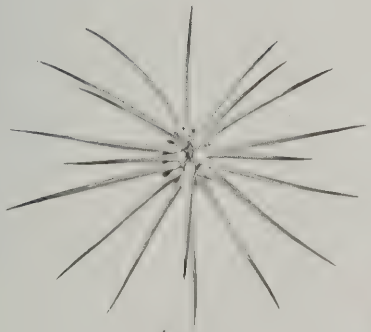
Roetter del
Dougal sc.

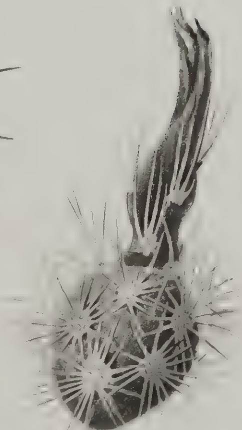
CEREUS DASYACANTHUS


3 a

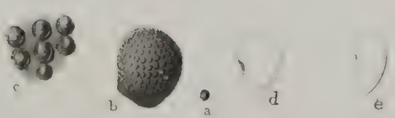

1

3 b


4 a


5

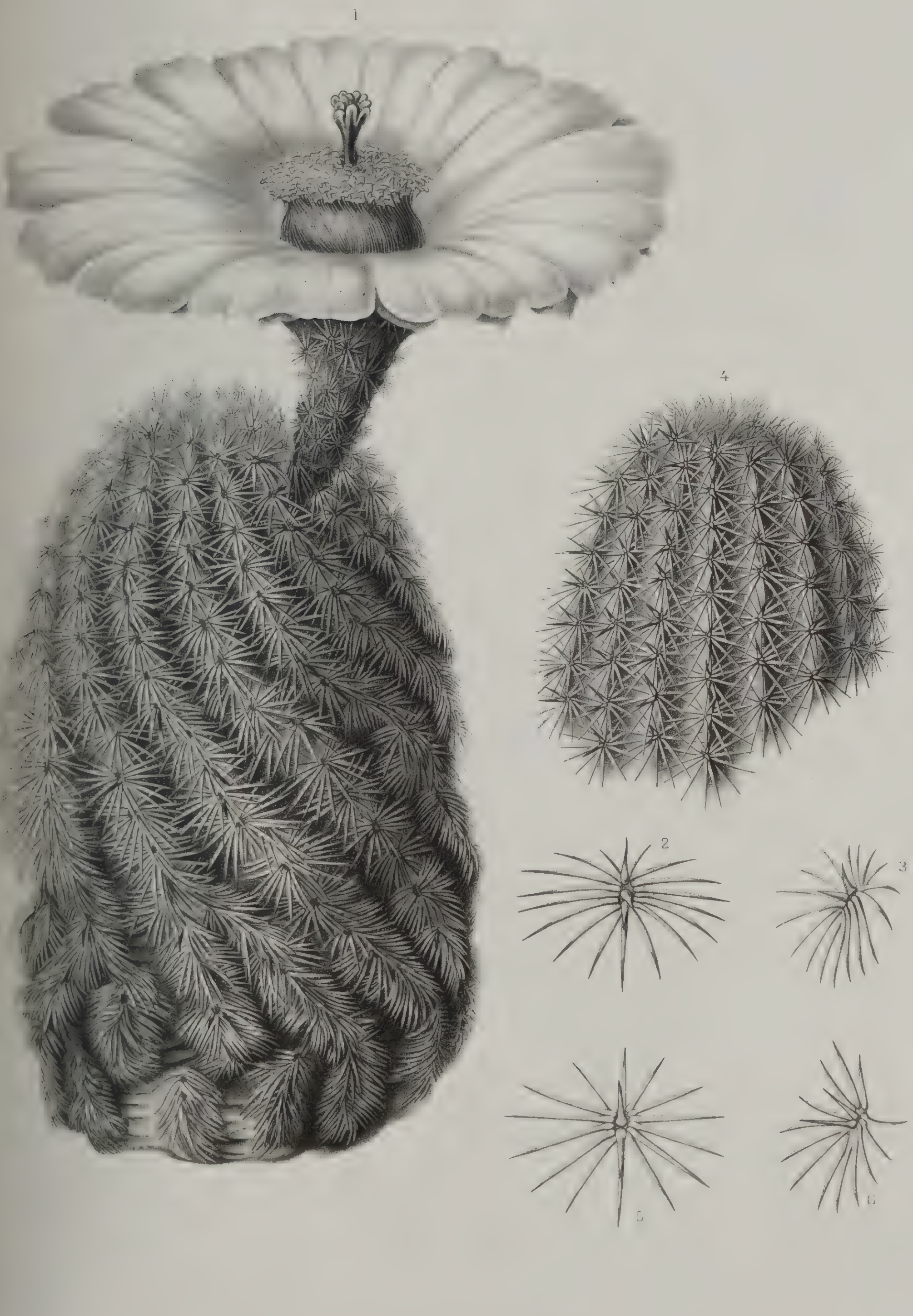
4 b



2

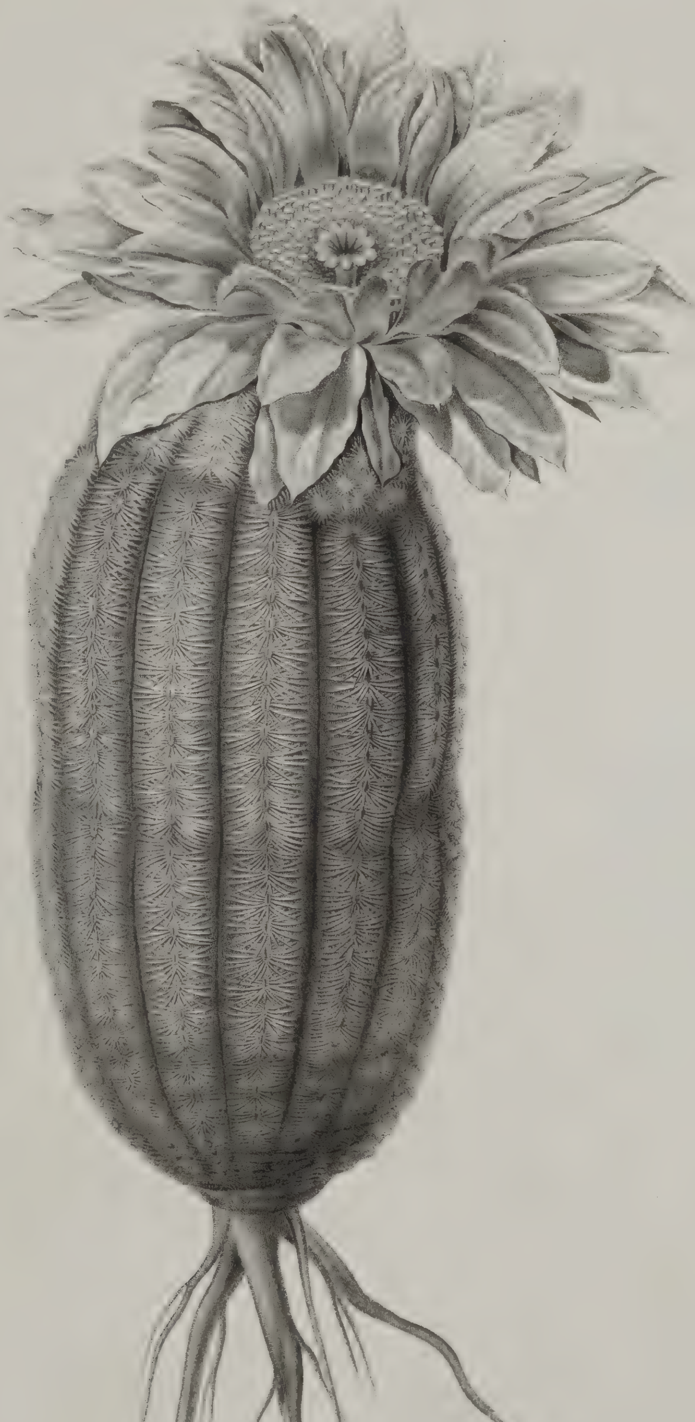
J.Roetter del. Dougal sc.

1–2 CEREUS DASYACANTHUS
3–5 " ROETTERI



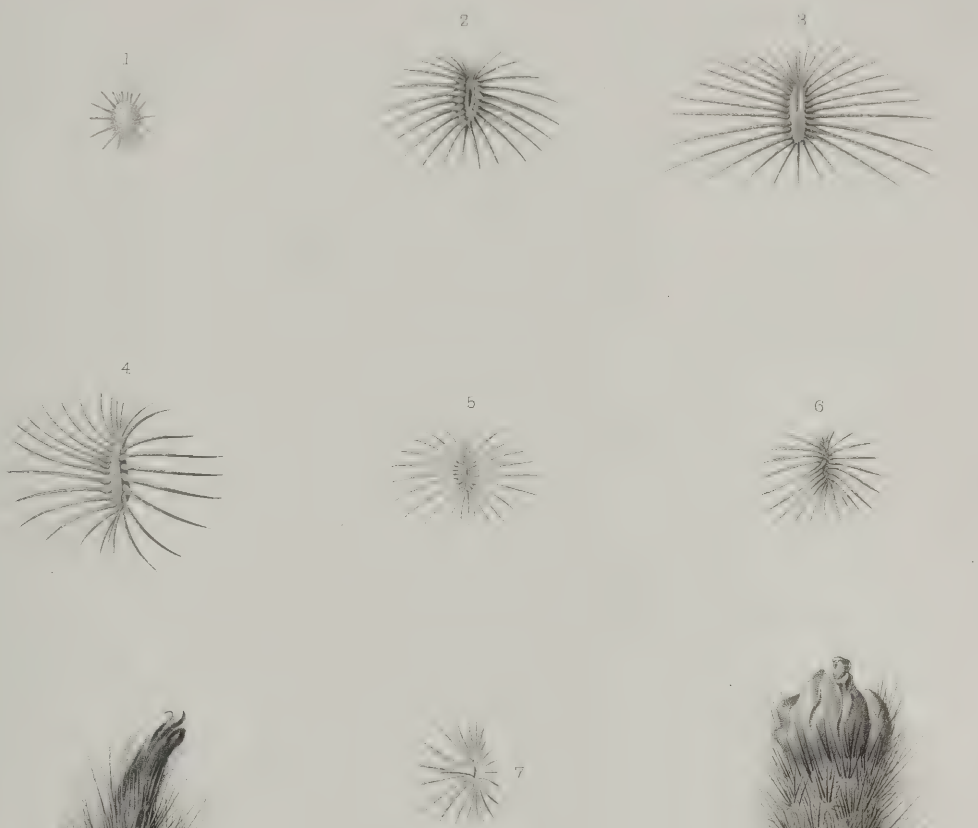
Roetter del.
Rebuffet sc.

CEREUS CTENOIDES



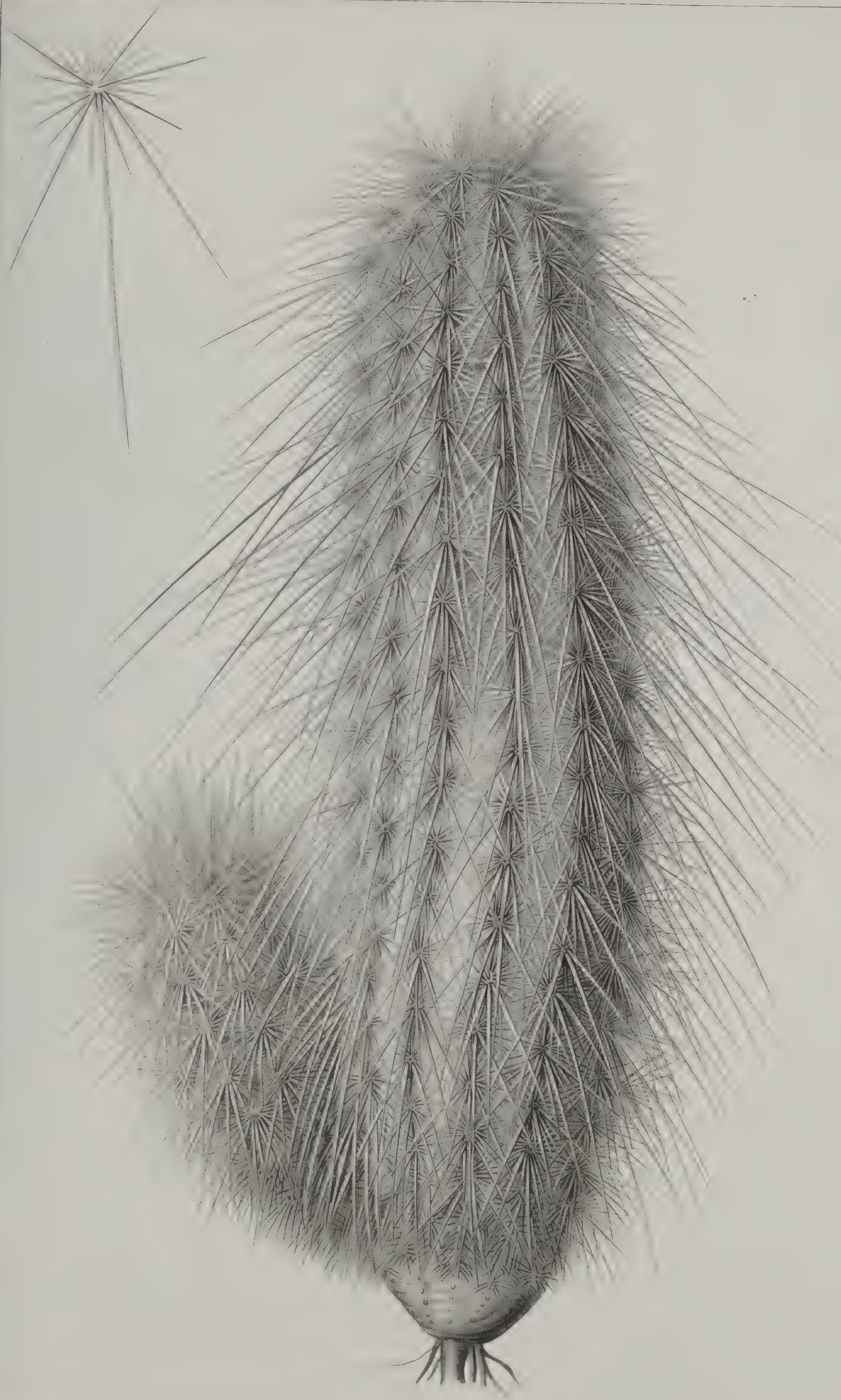
Roetter del [illegible]

CEREUS CÆSPITOSUS



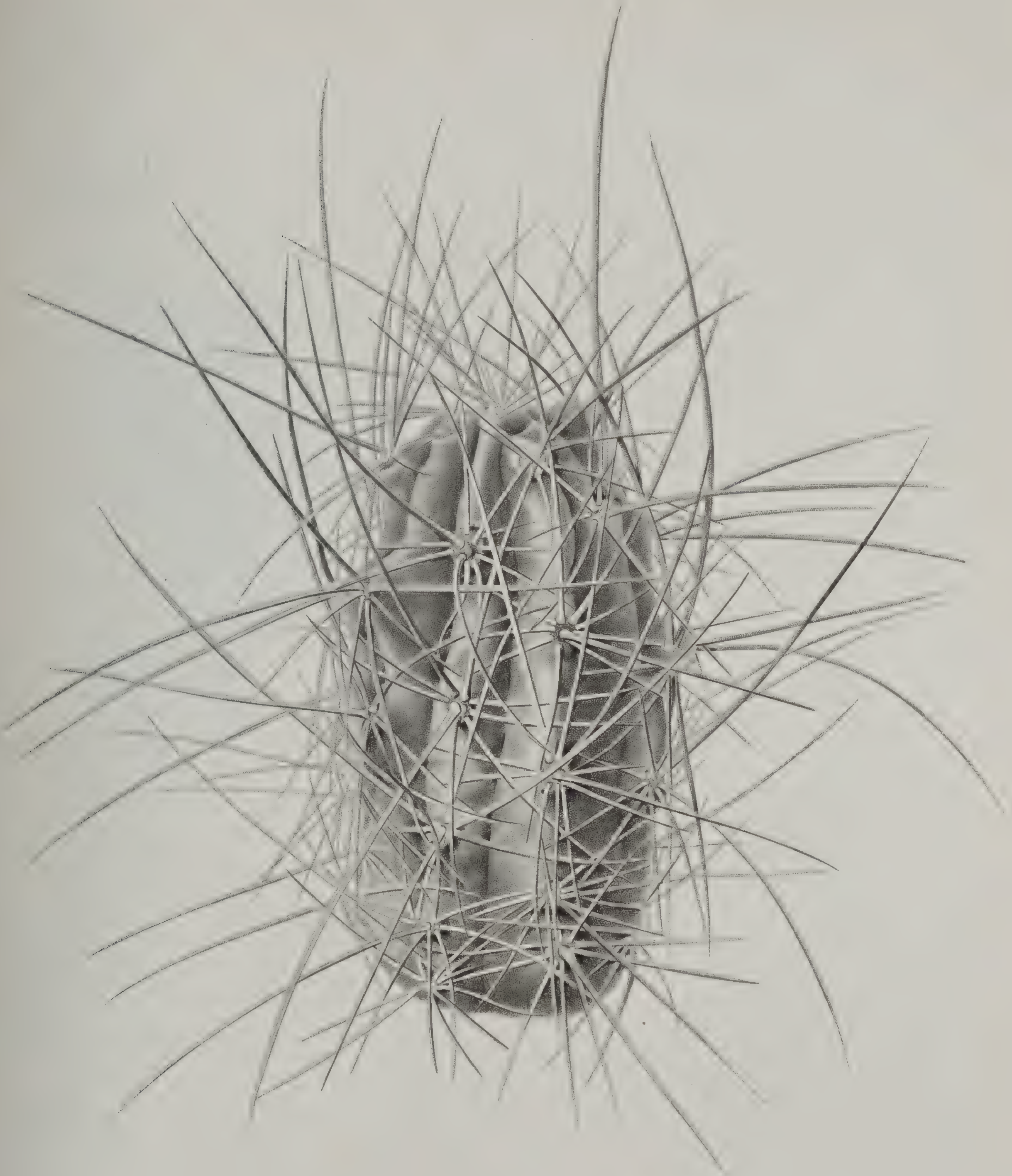
P. Roetter del.
M. Schmelz sc.

CEREUS CÆSPITOSUS



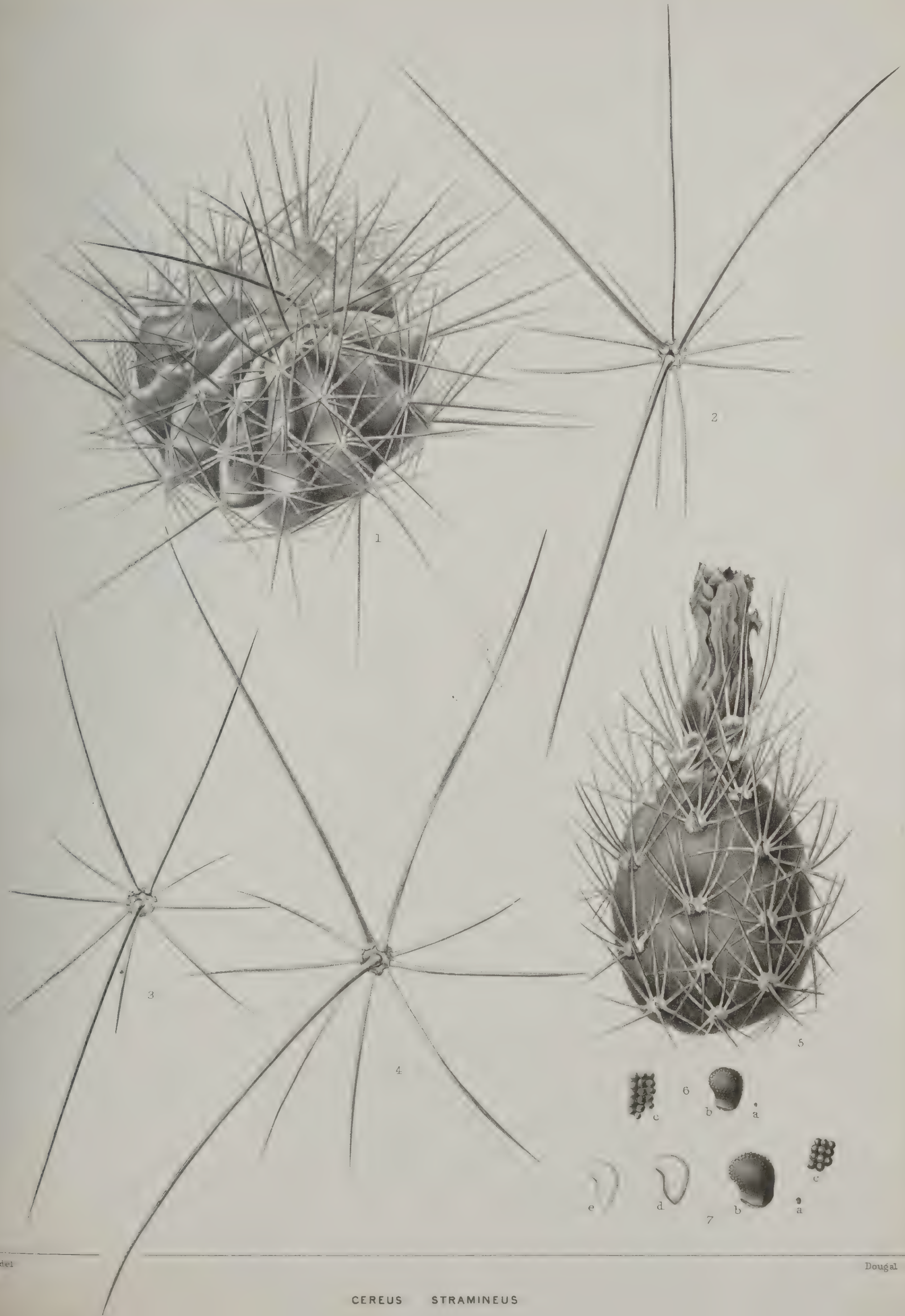
P. Roetter del. M. Schmelz sc.

CEREUS LONGISETUS



Roetter del. Dougal sc.

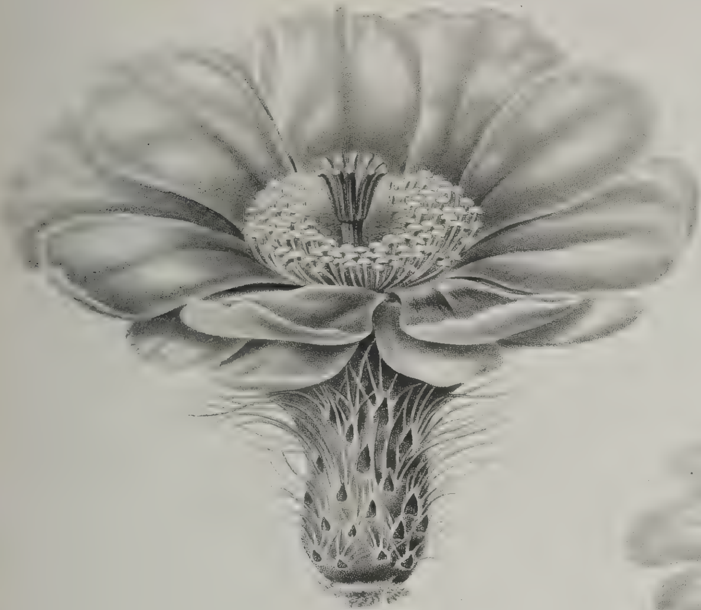
CEREUS STRAMINEUS

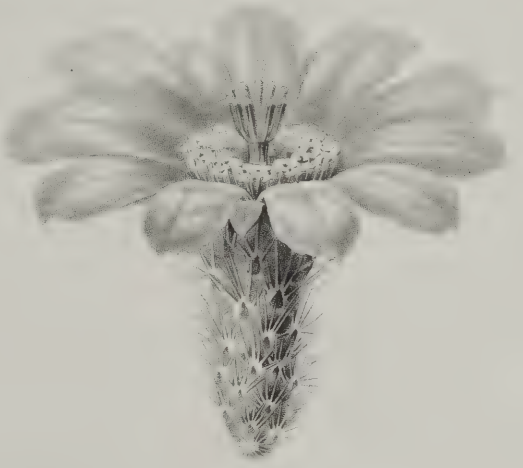


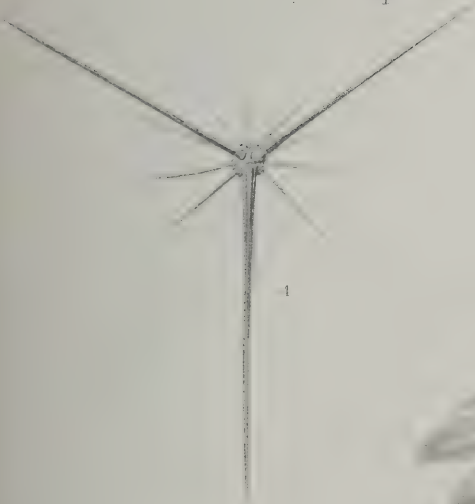
P.Roetter del

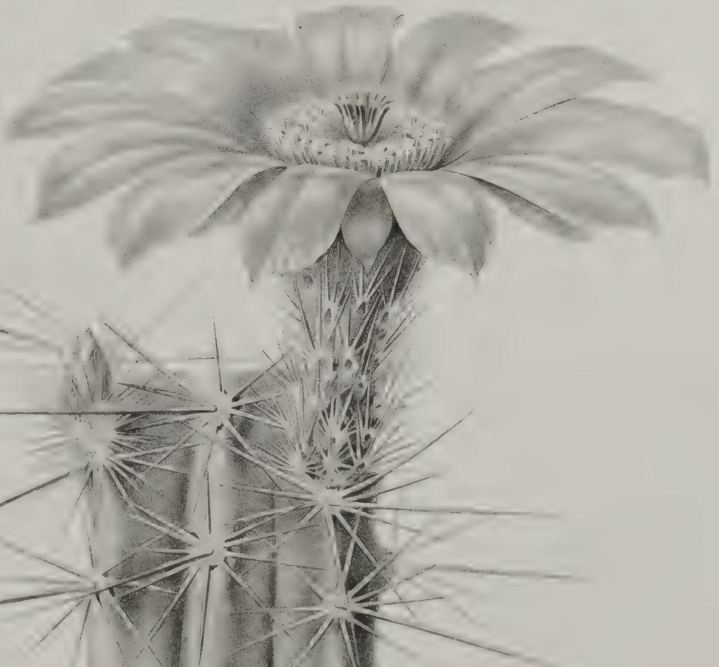
Dougal sc

CEREUS STRAMINEUS


1

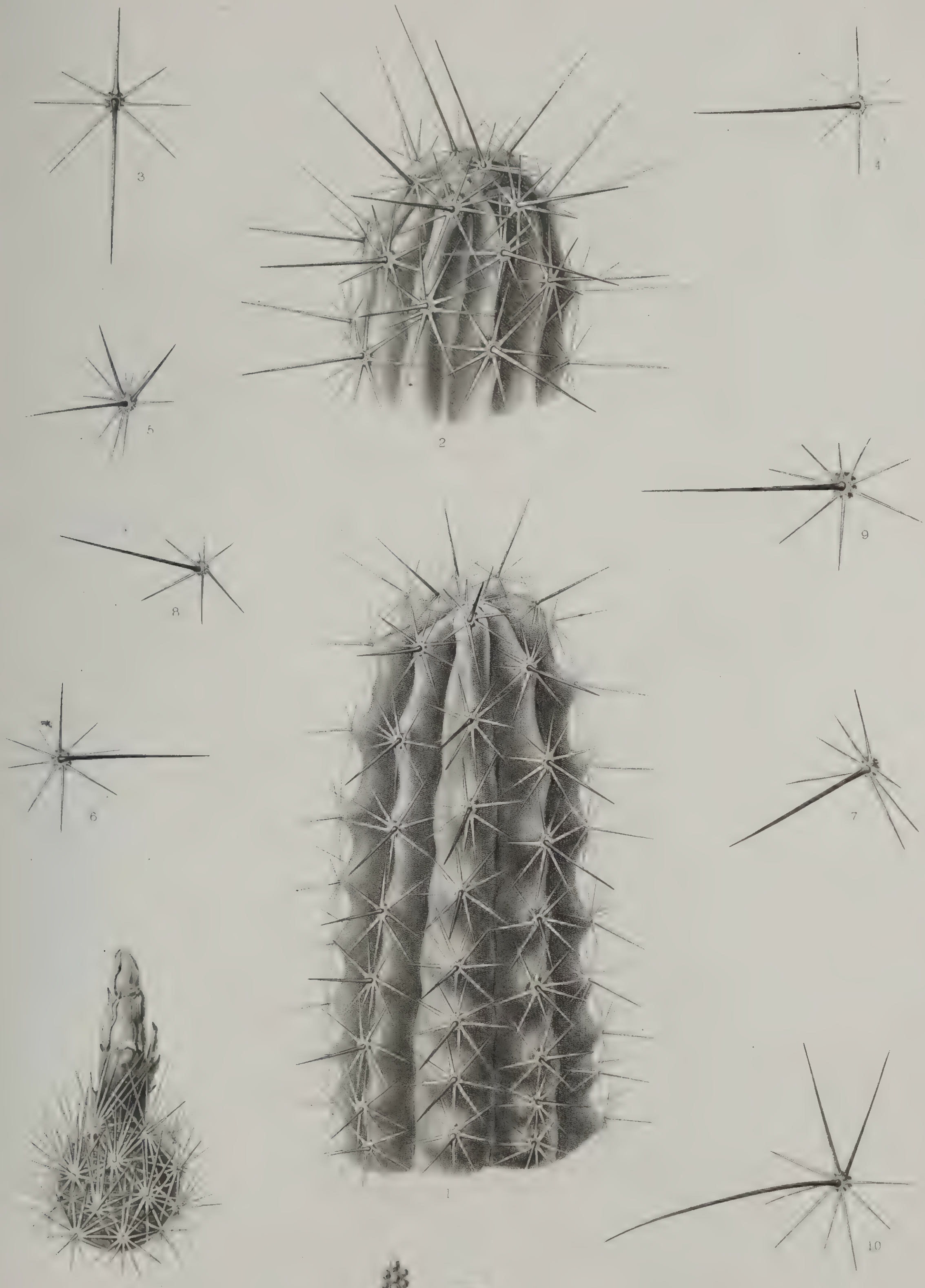

3


4


2

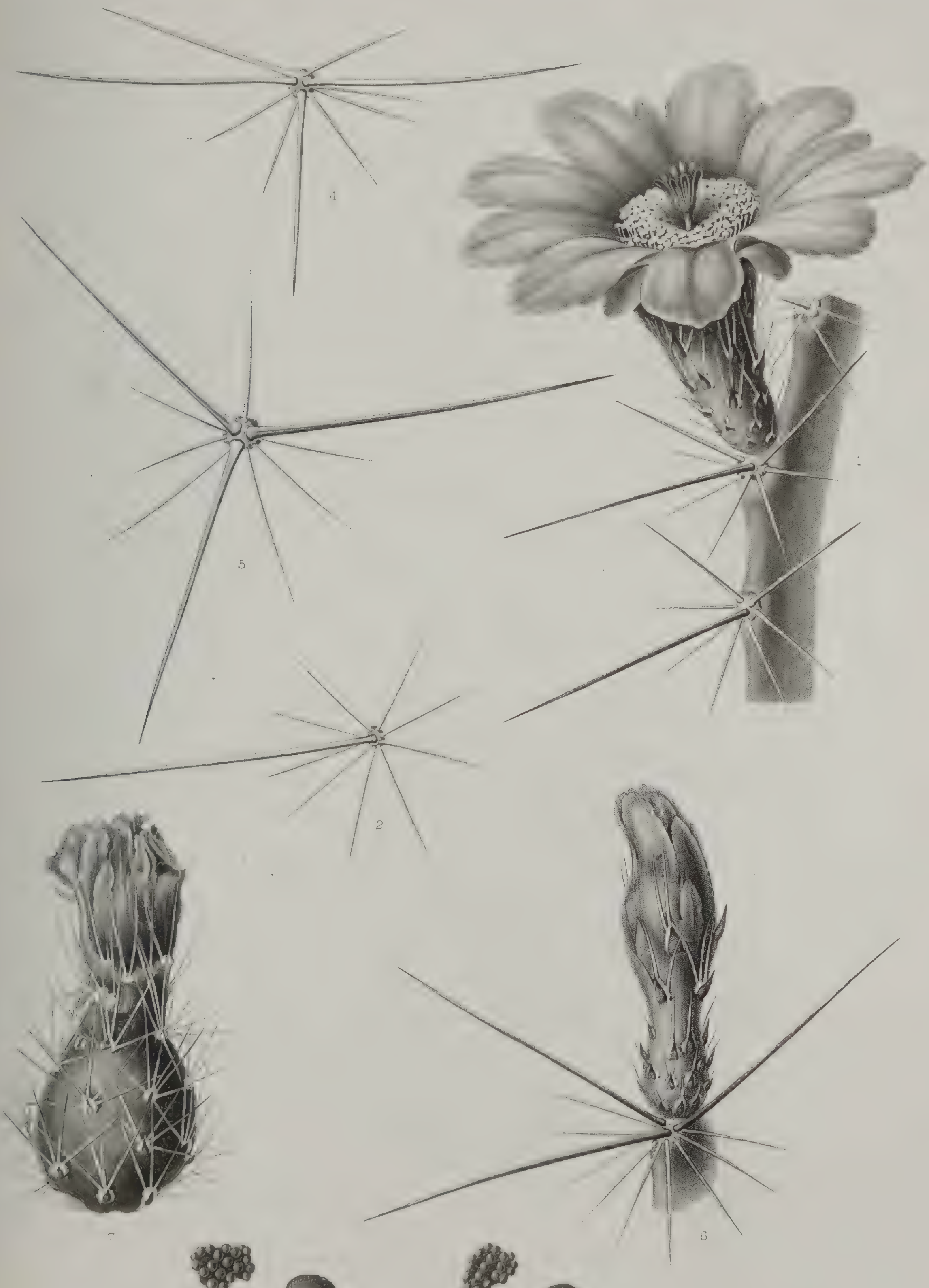
Dougal sc

1 CEREUS STRAMINEUS 2 4 CEREUS ENNEACANTHUS



P. Roetter del. Dougal sc.

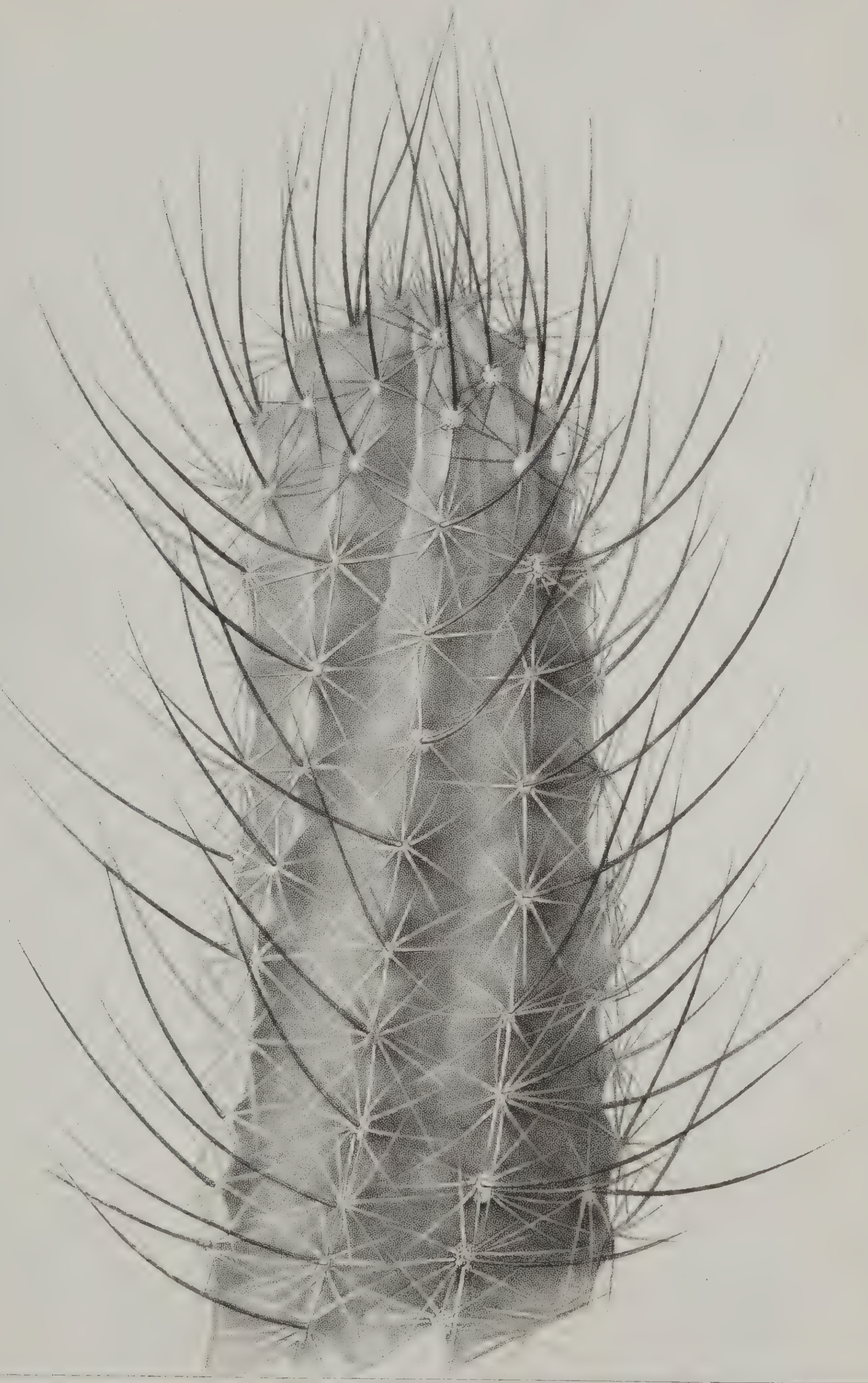
CEREUS ENNEACANTHUS



Roetter del

Dougal sc.

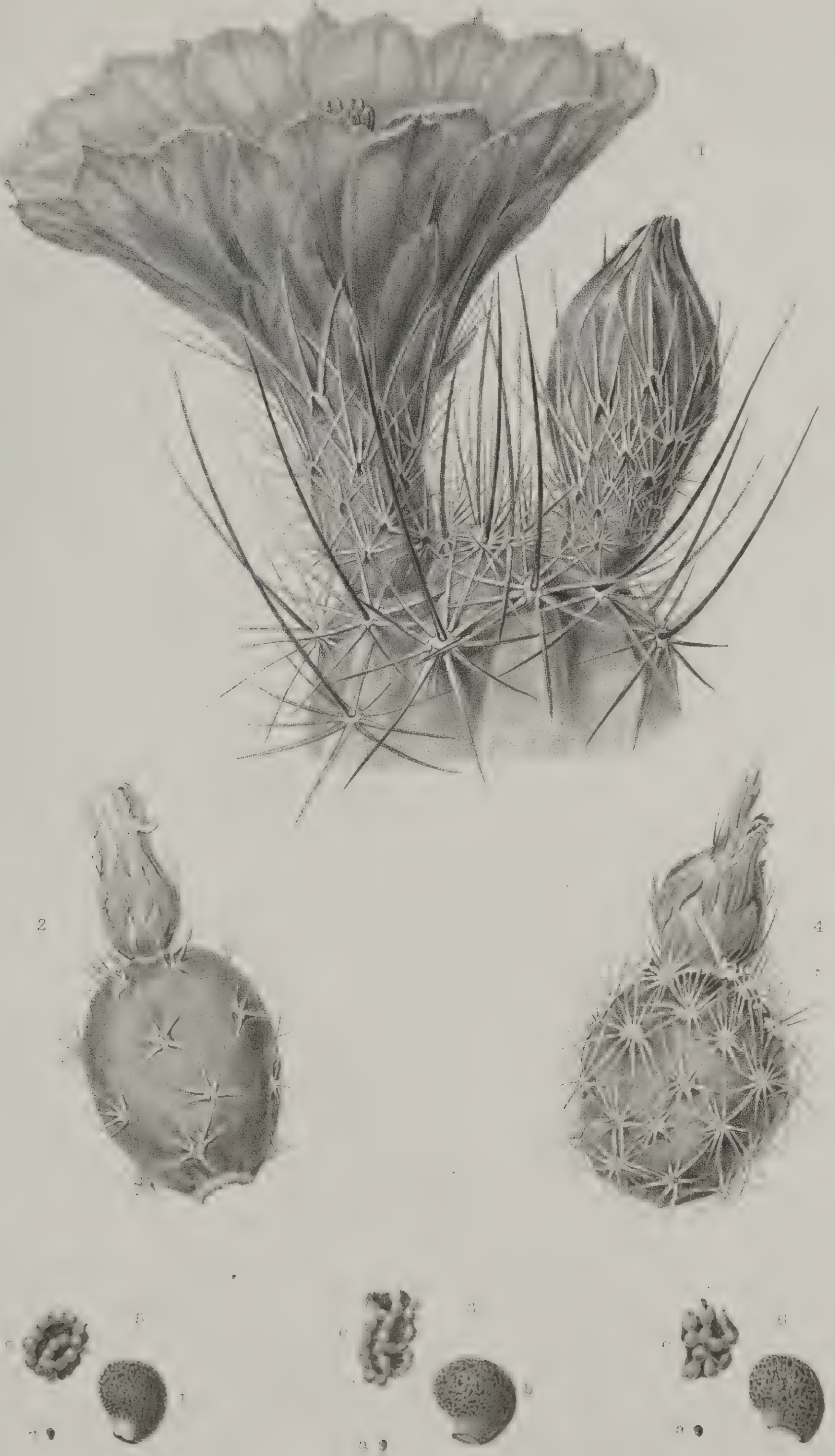
CEREUS DUBIUS



P Roetter del

Weber sc.

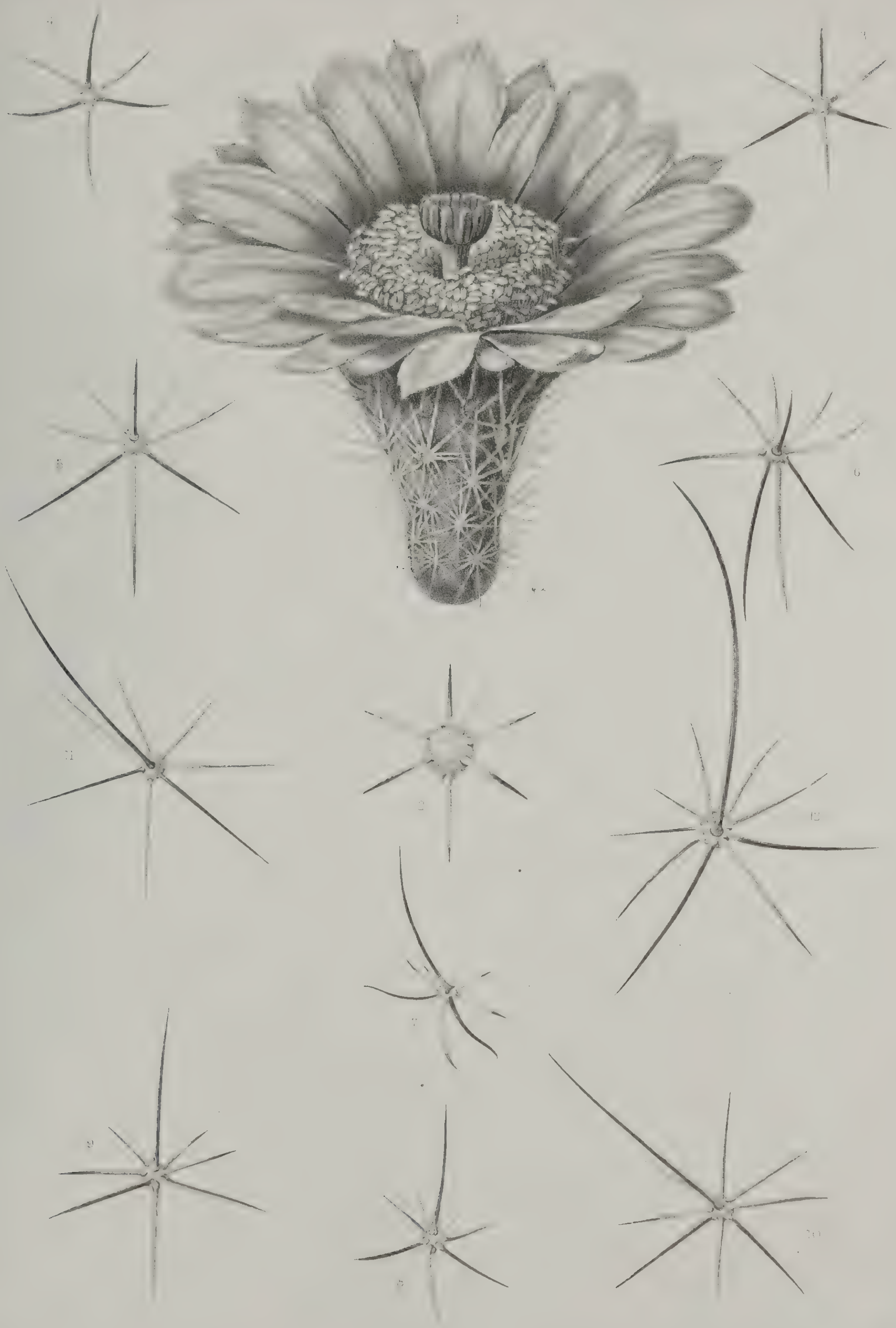
CEREUS FENDLERI



P. Roetter del.

Weber sc.

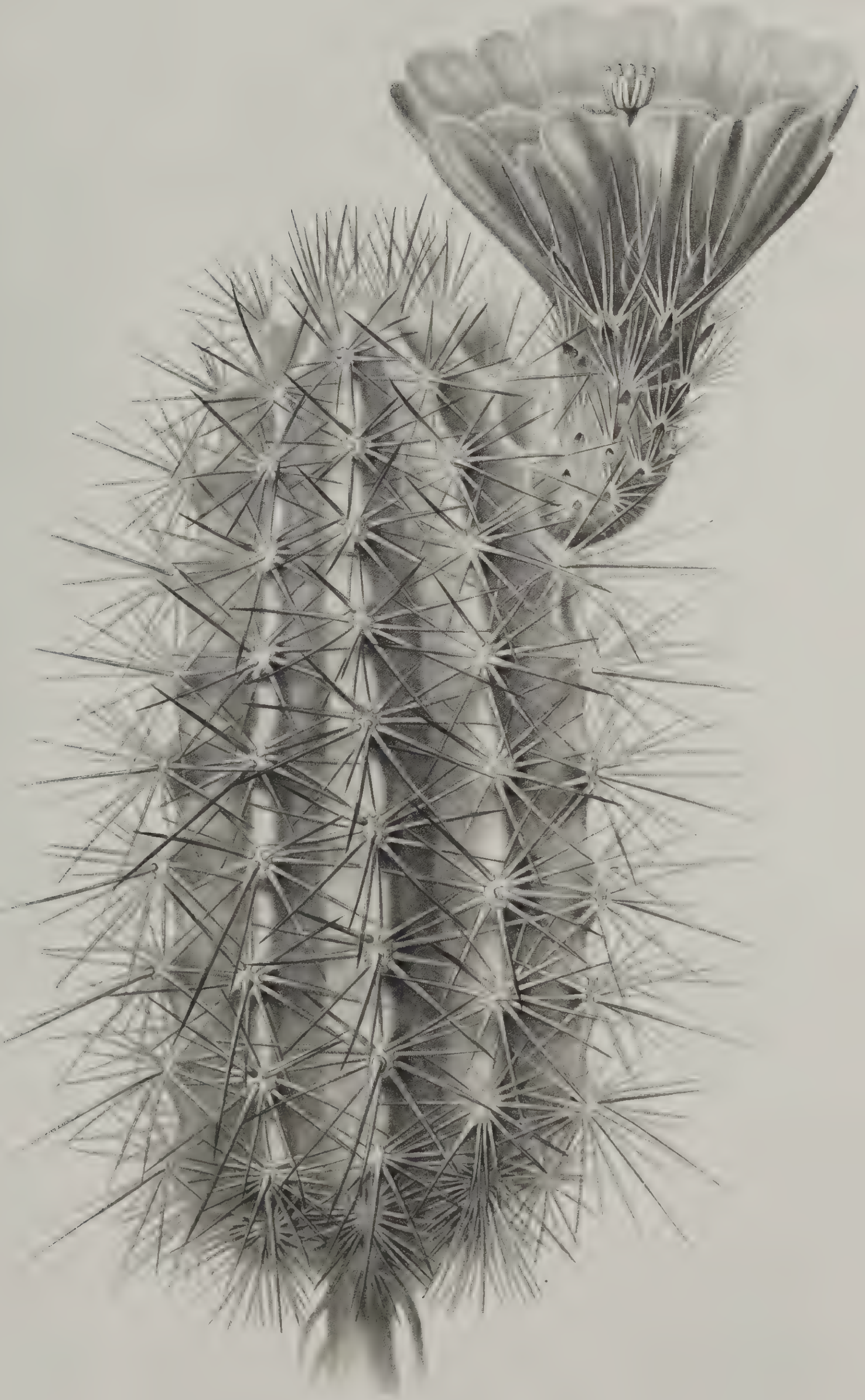
CEREUS FENDLERI



P. Roetter del.

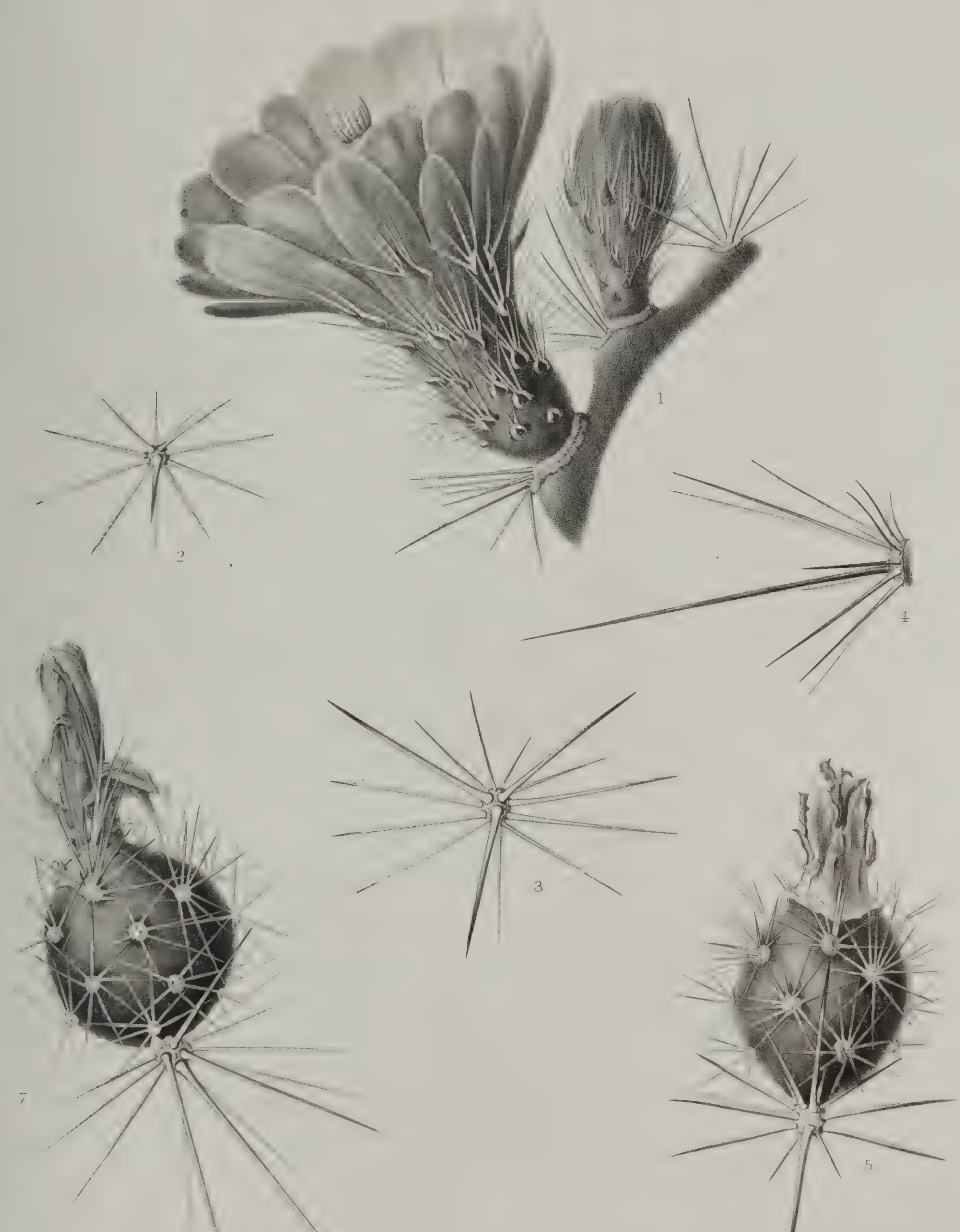
[illegible]

CEREUS FENDLERI



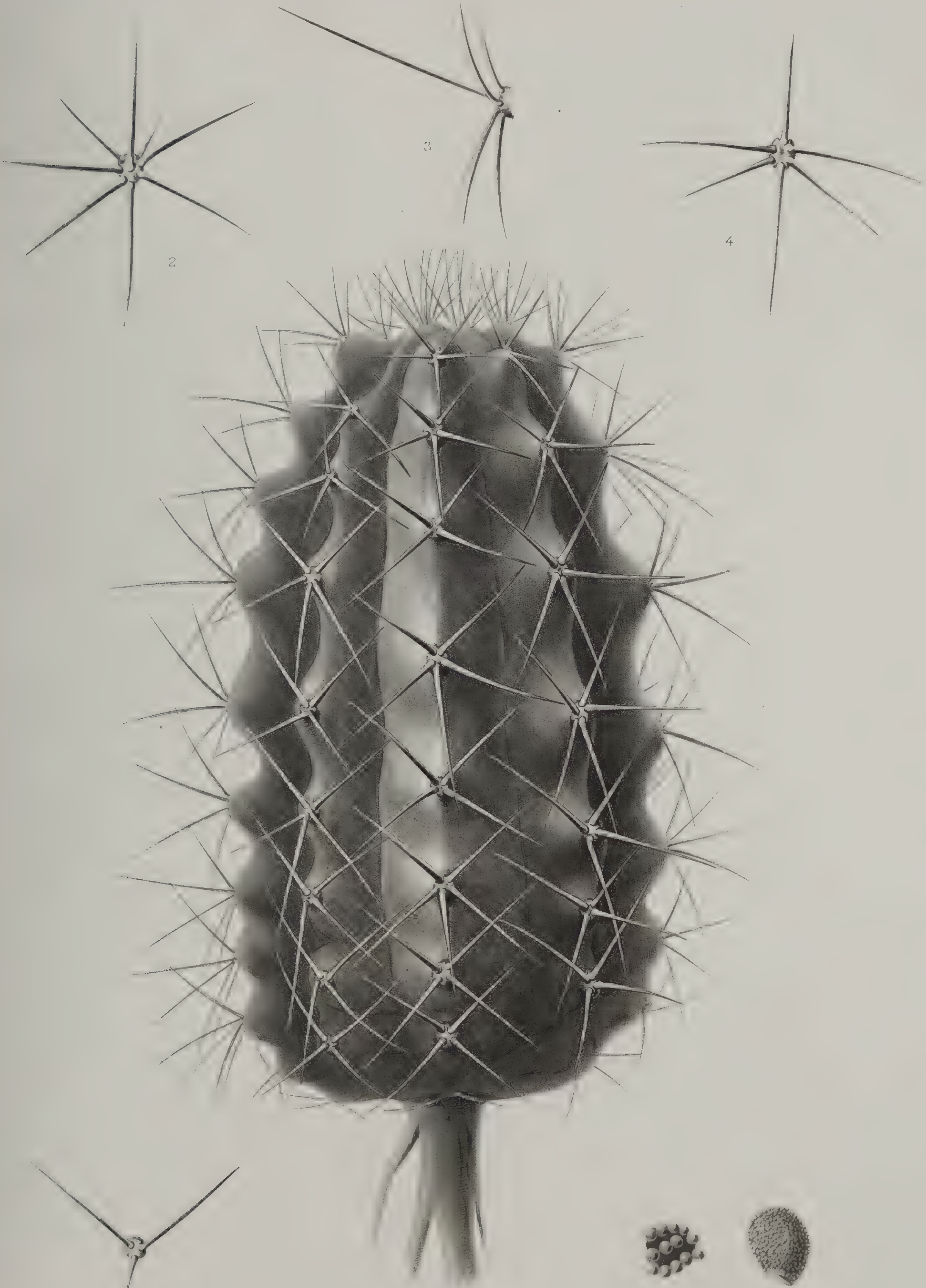
Sonrel sc

CEREUS POLYACANTHUS



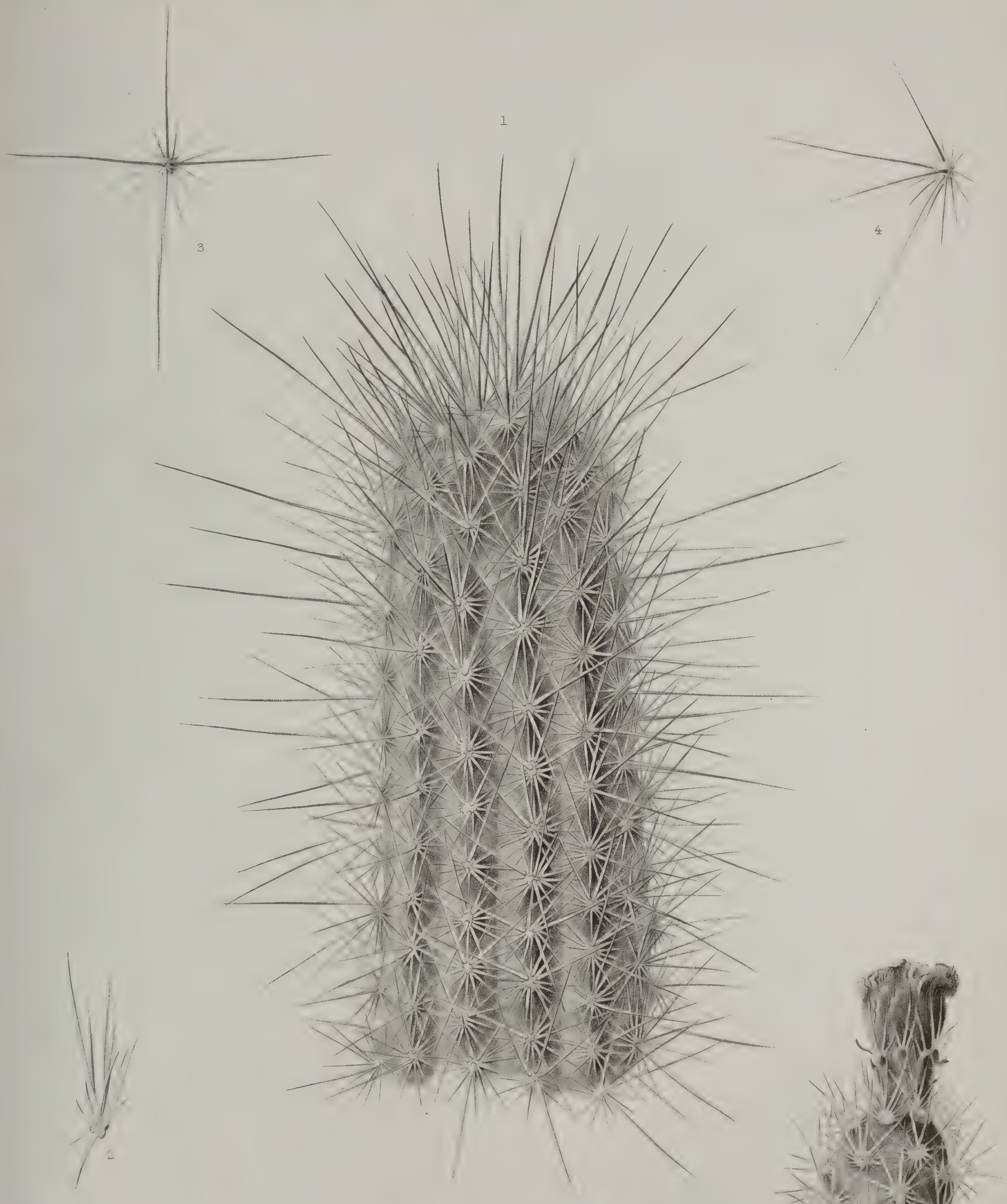
Roetter del. Dougal sc.

CEREUS POLYACANTHUS



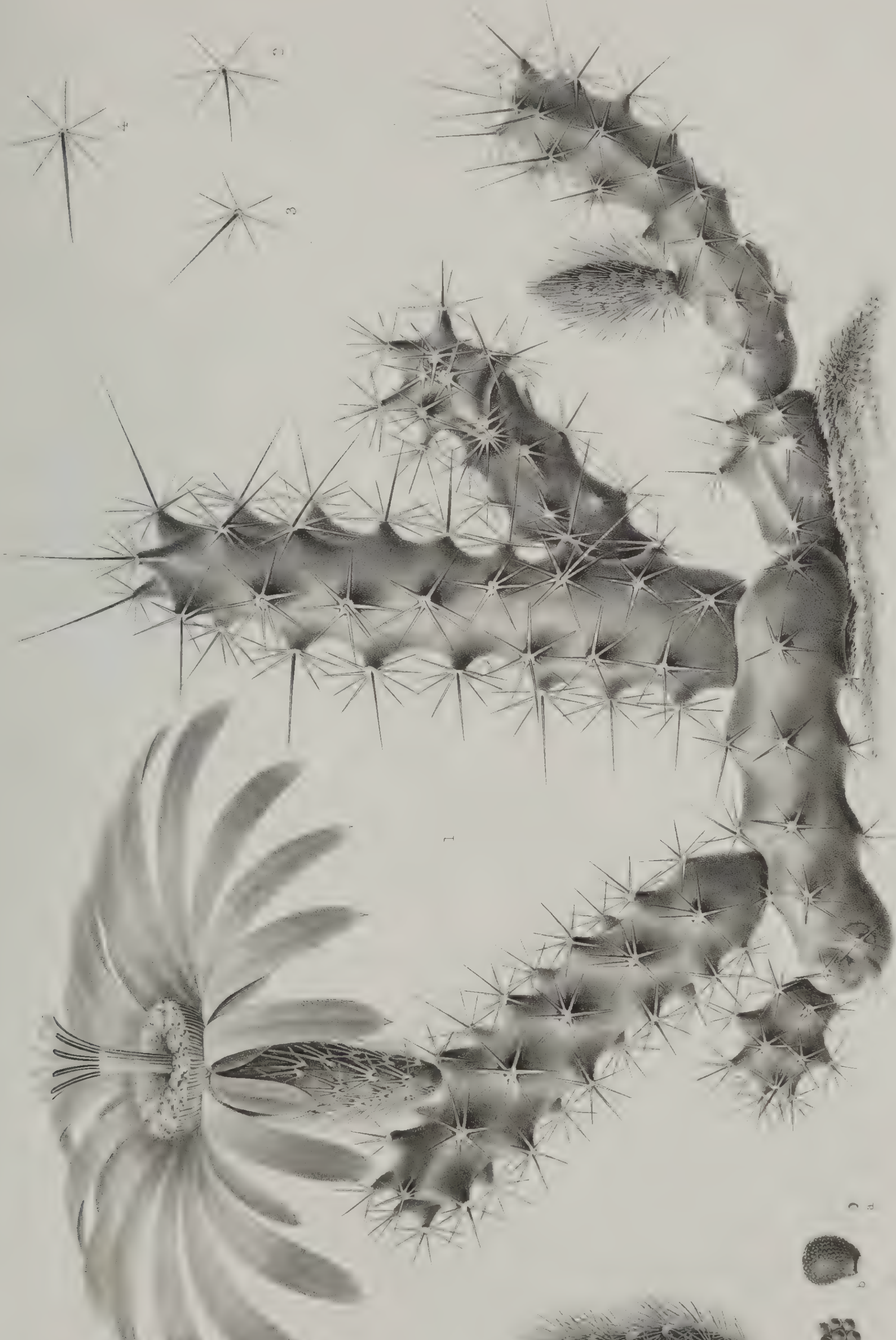
oetter del. Dougal sc

CEREUS PAUCISPINUS



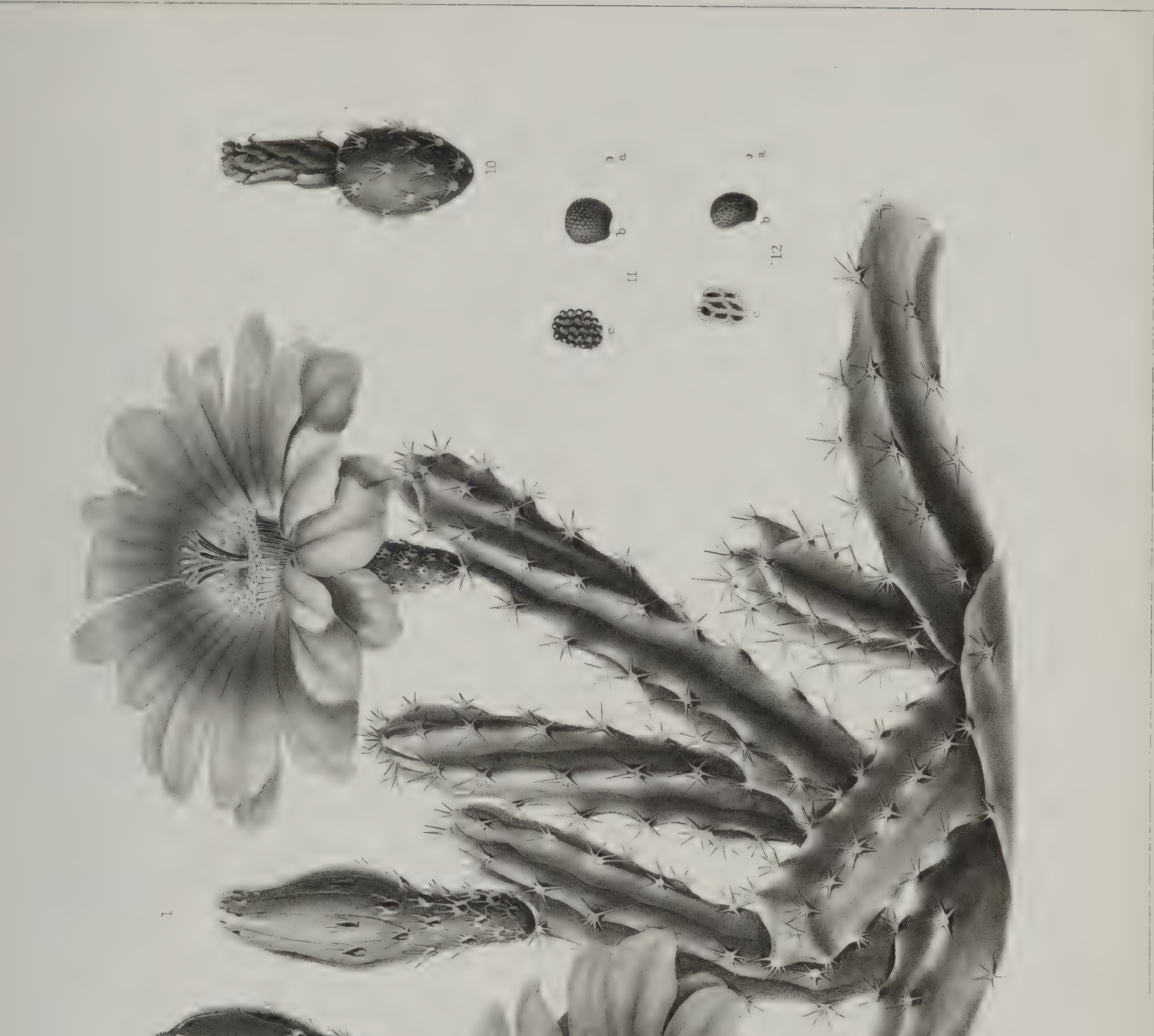
F. Roetter del. Dougal sc.

CEREUS ENGELMANNI



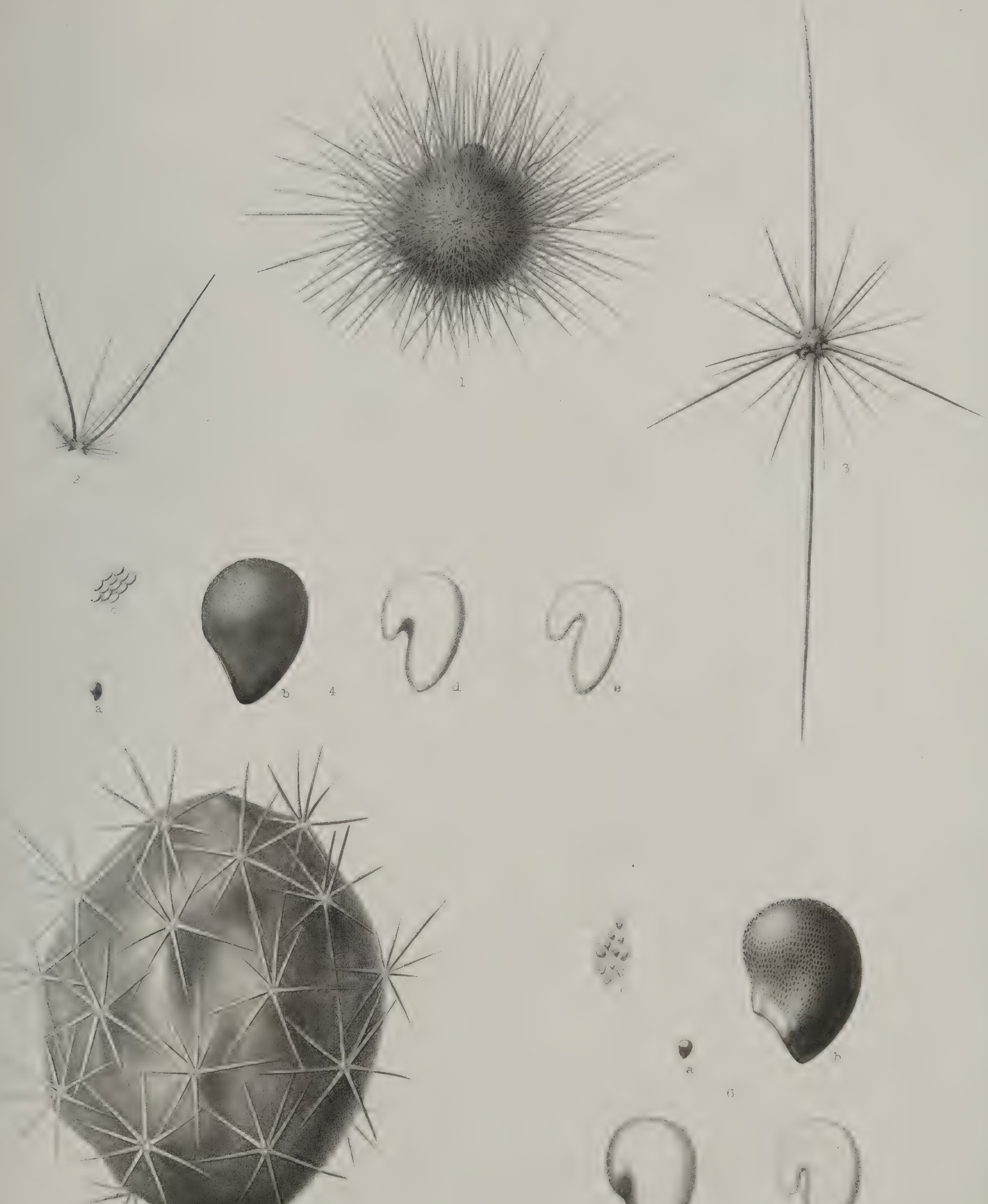
CEREUS BERLANDIERI

[illegible] del. Dougal sc.



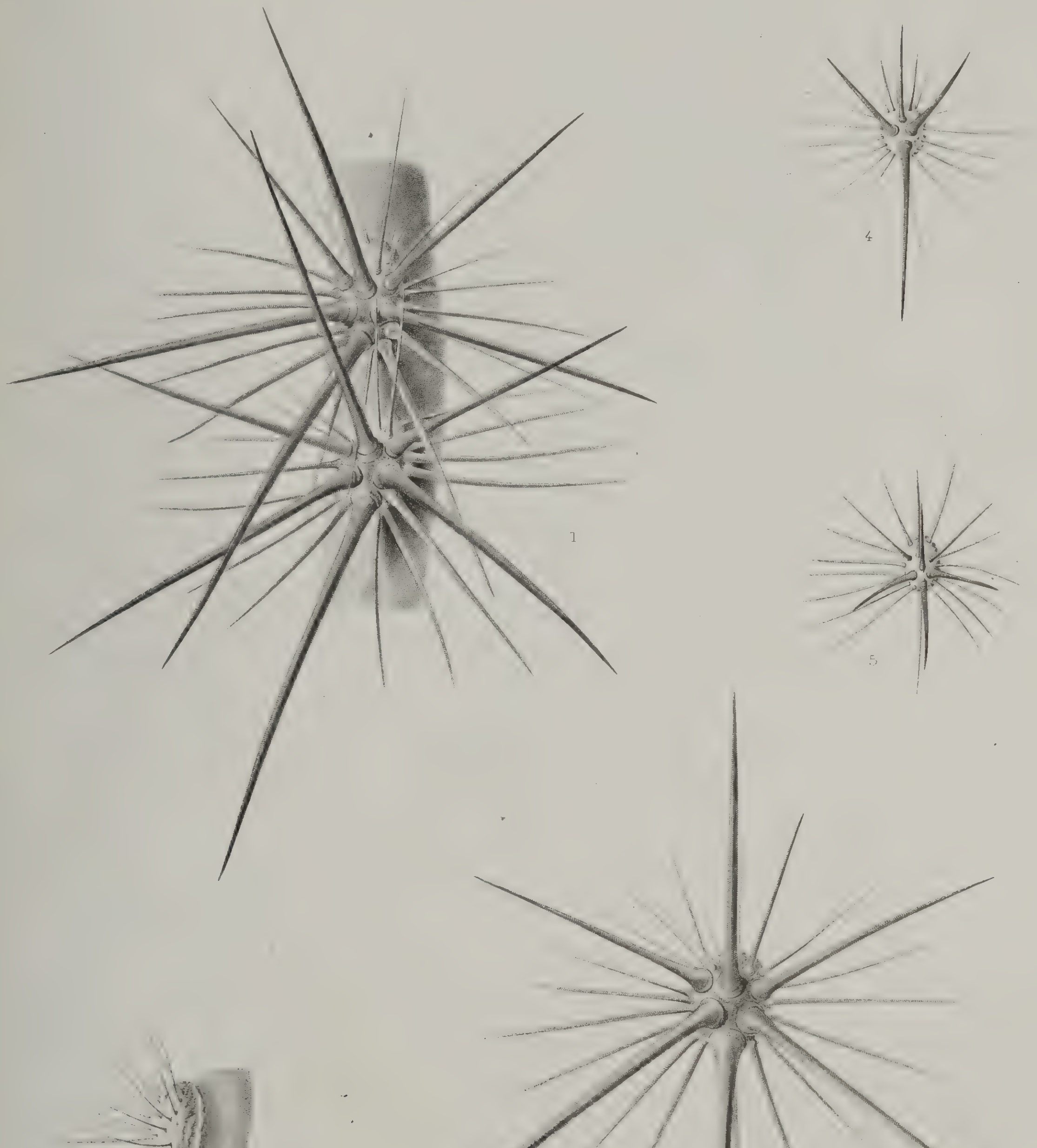
P. Roetter del.

Dougal sc.



[illegible] del. Dougal sc.

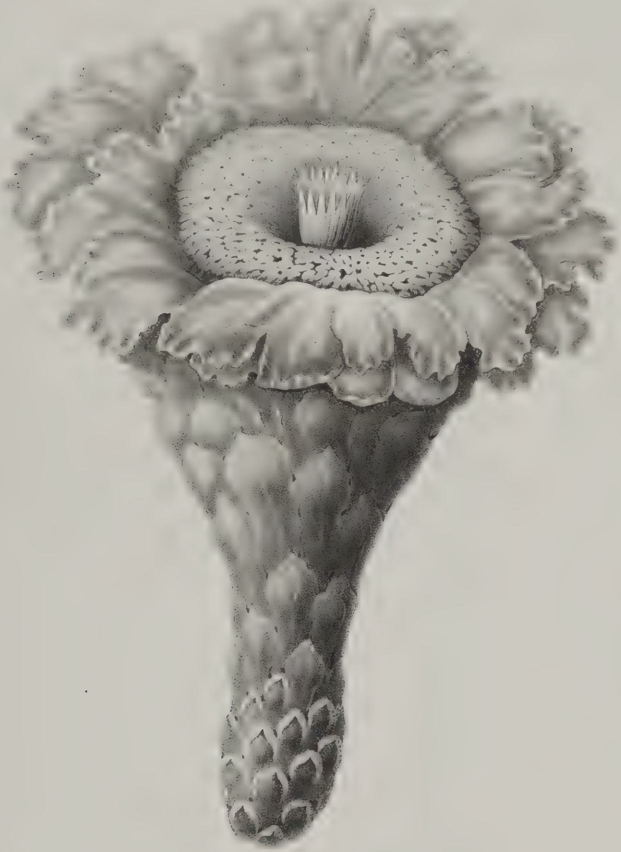
1—4 CEREUS EMORYI 5—6 CEREUS VARIABILIS



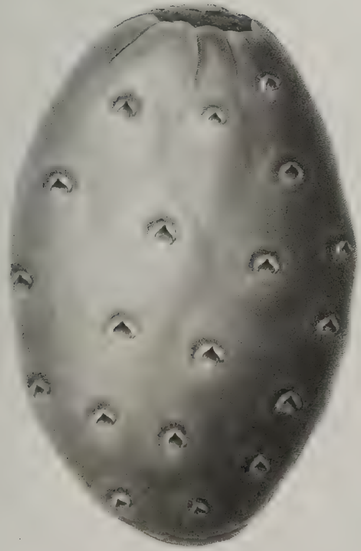
[illegible] del.

Dougal sc.

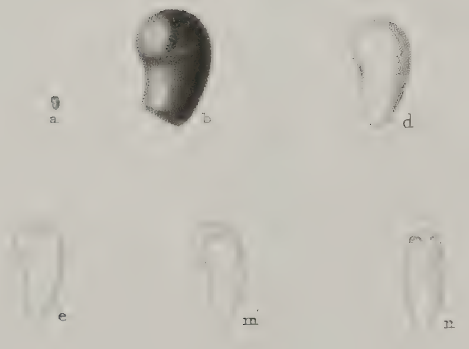
CEREUS GIGANTEUS



1



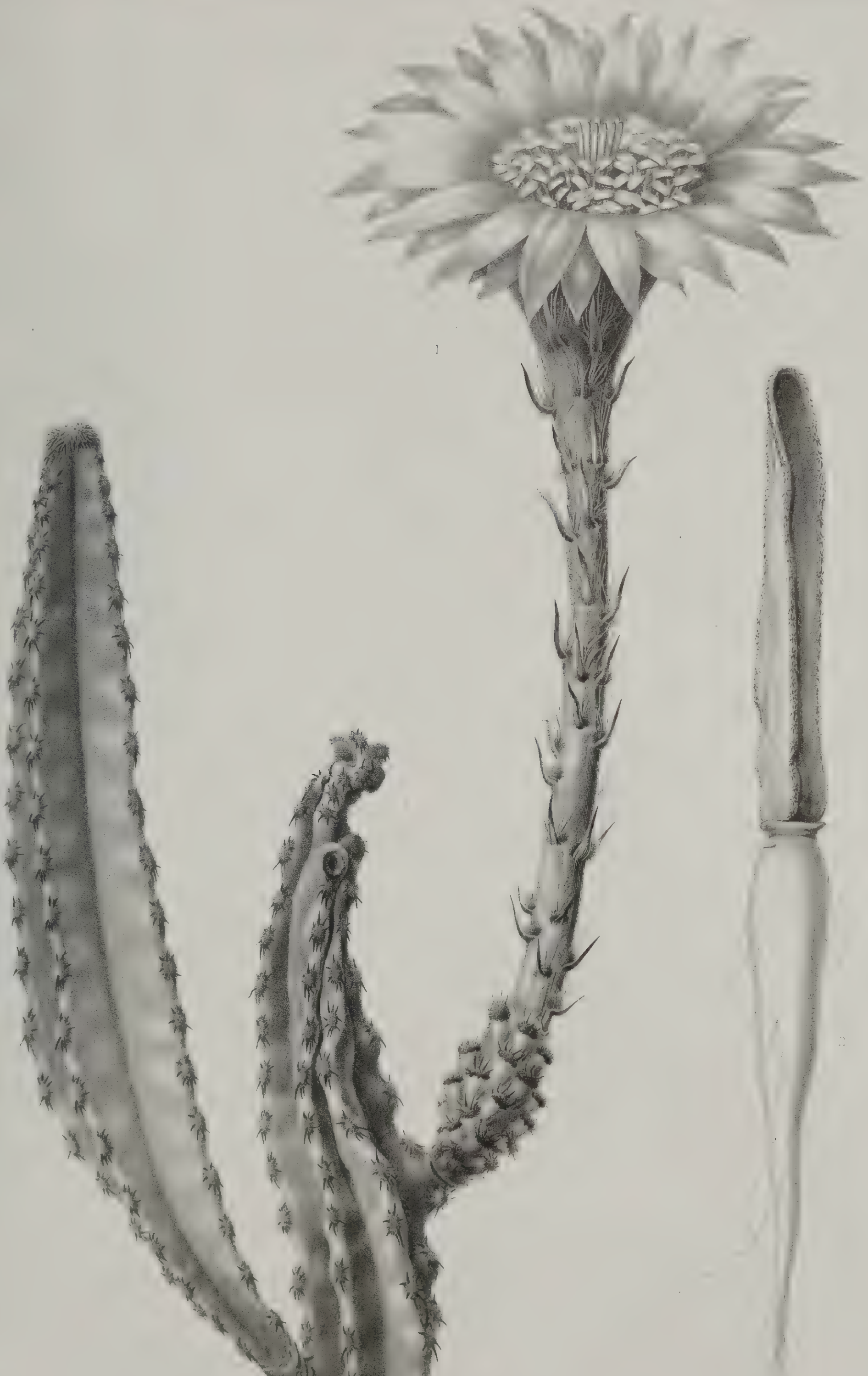
2



3

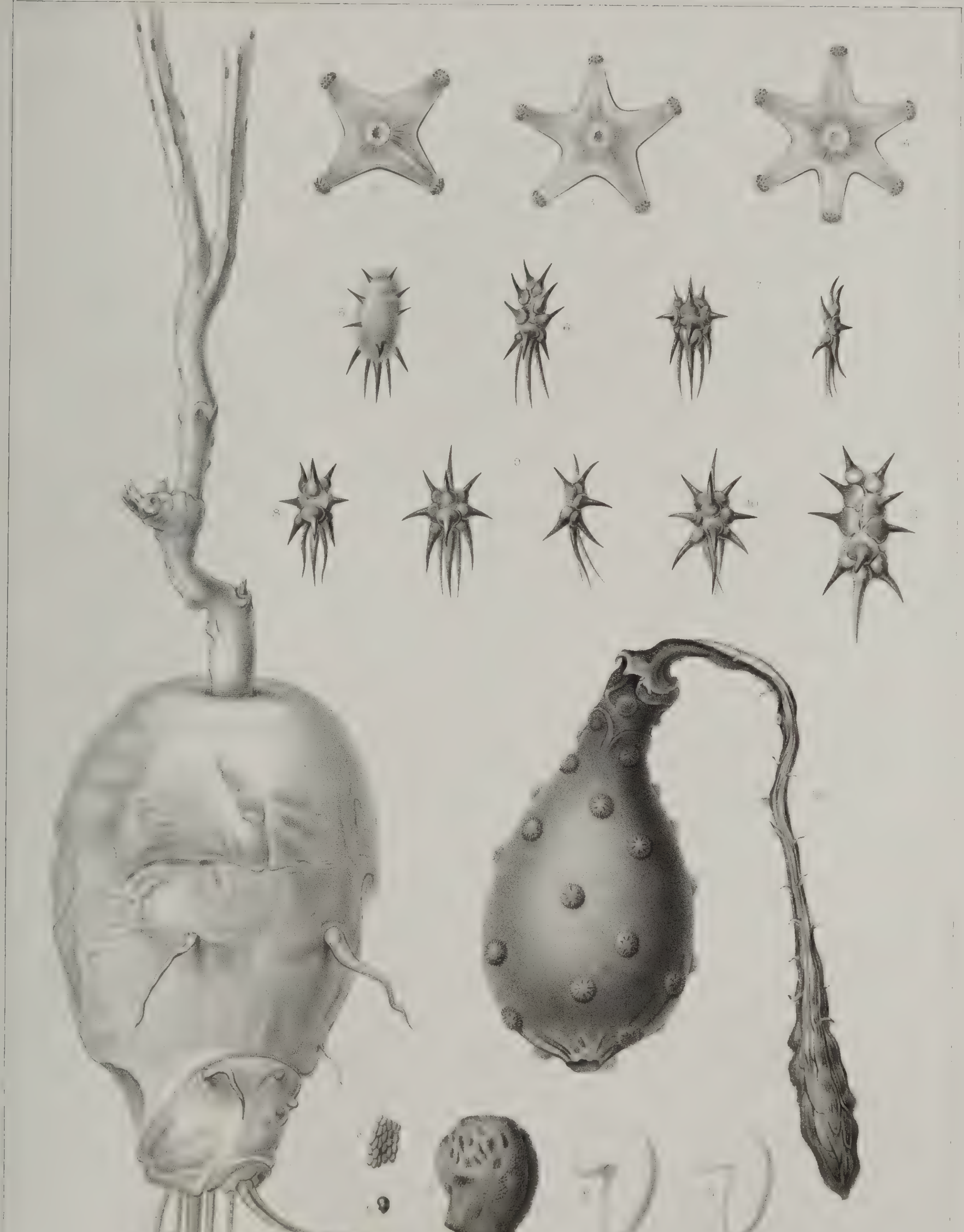
[illegible] del. Dougal sc.

CEREUS GIGANTEUS



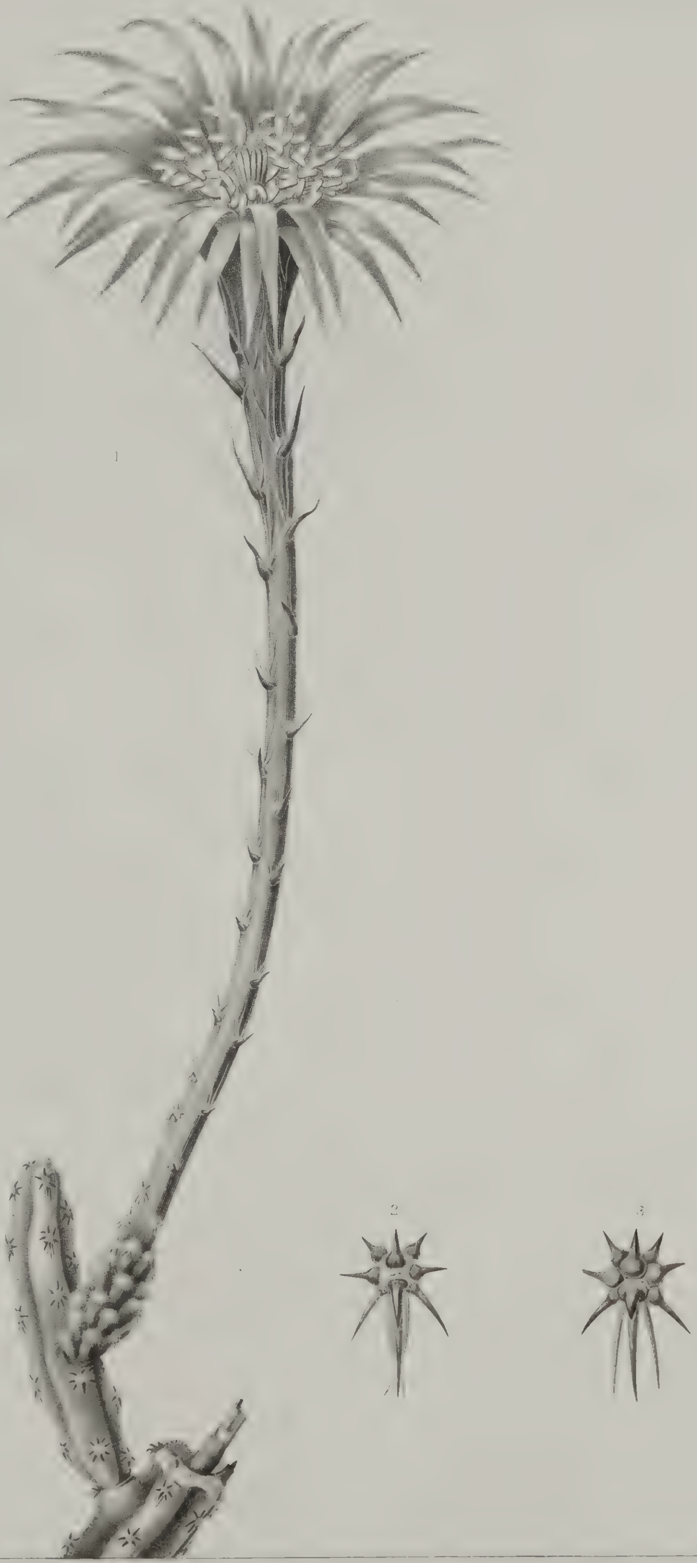
P Roetter del

CEREUS GREGGII



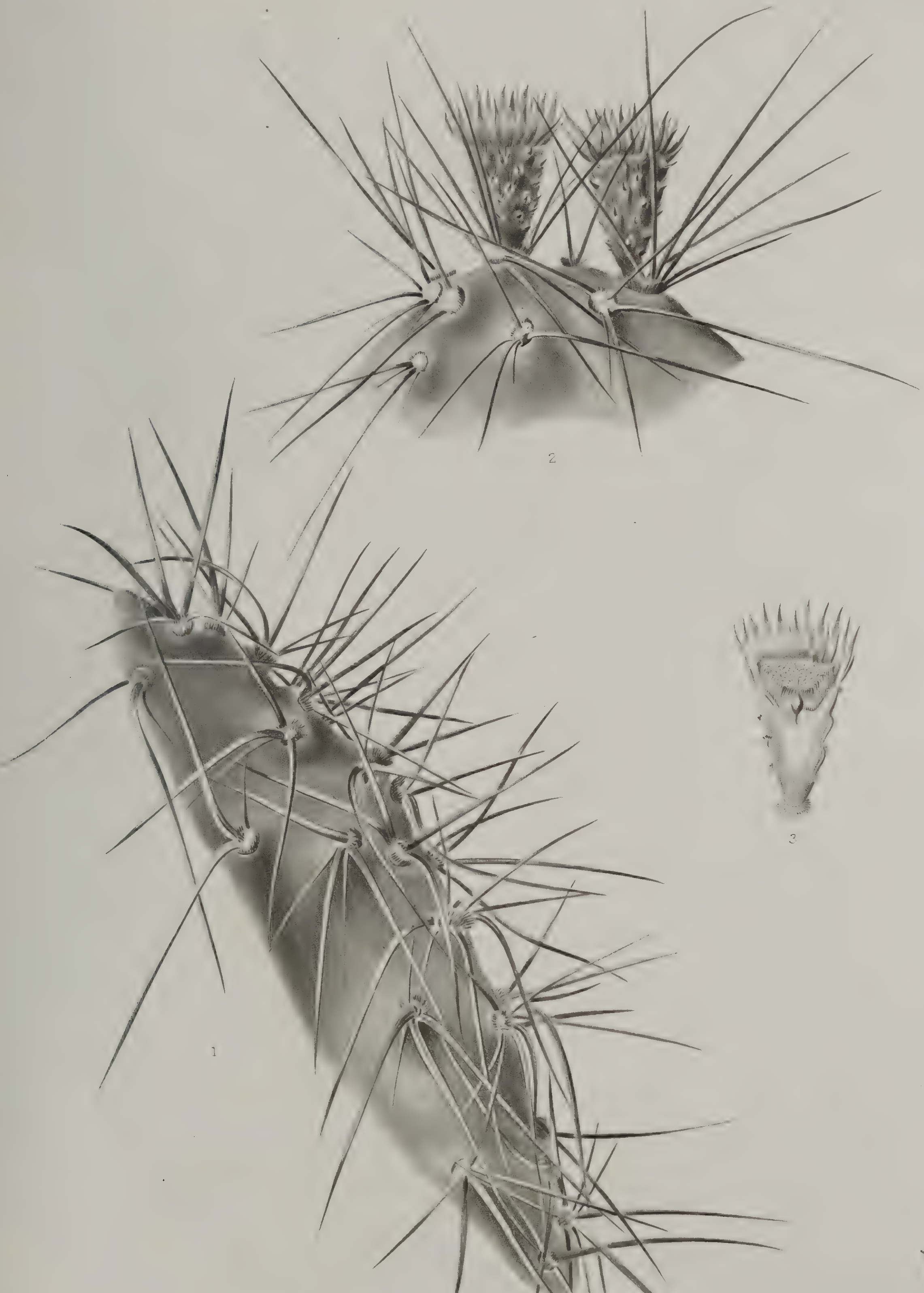
P. Roetter del.

CEREUS GREGGII



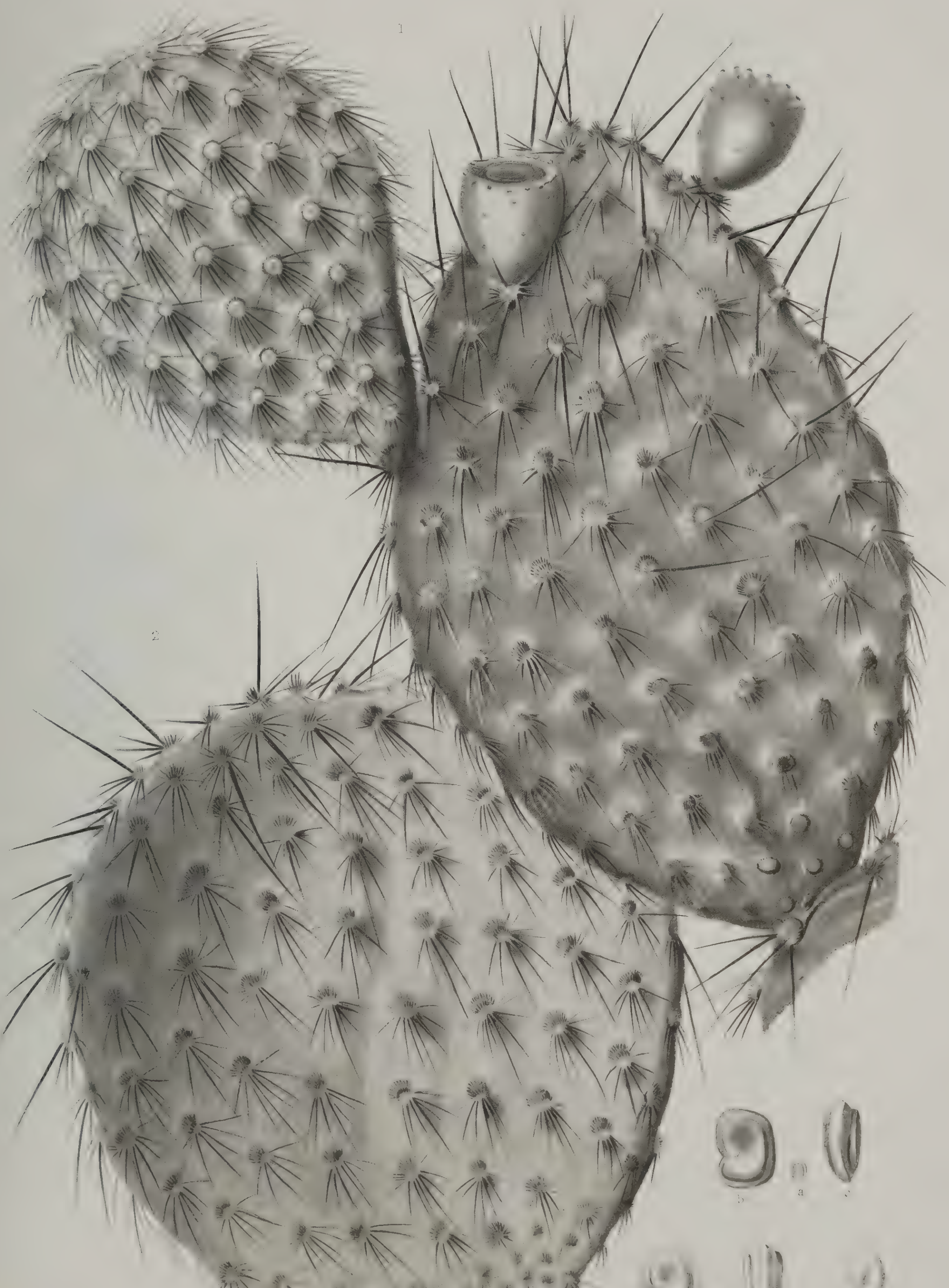
P. Roetter del. Picart sc.

CEREUS GREGGII β TRANSMONTANUS



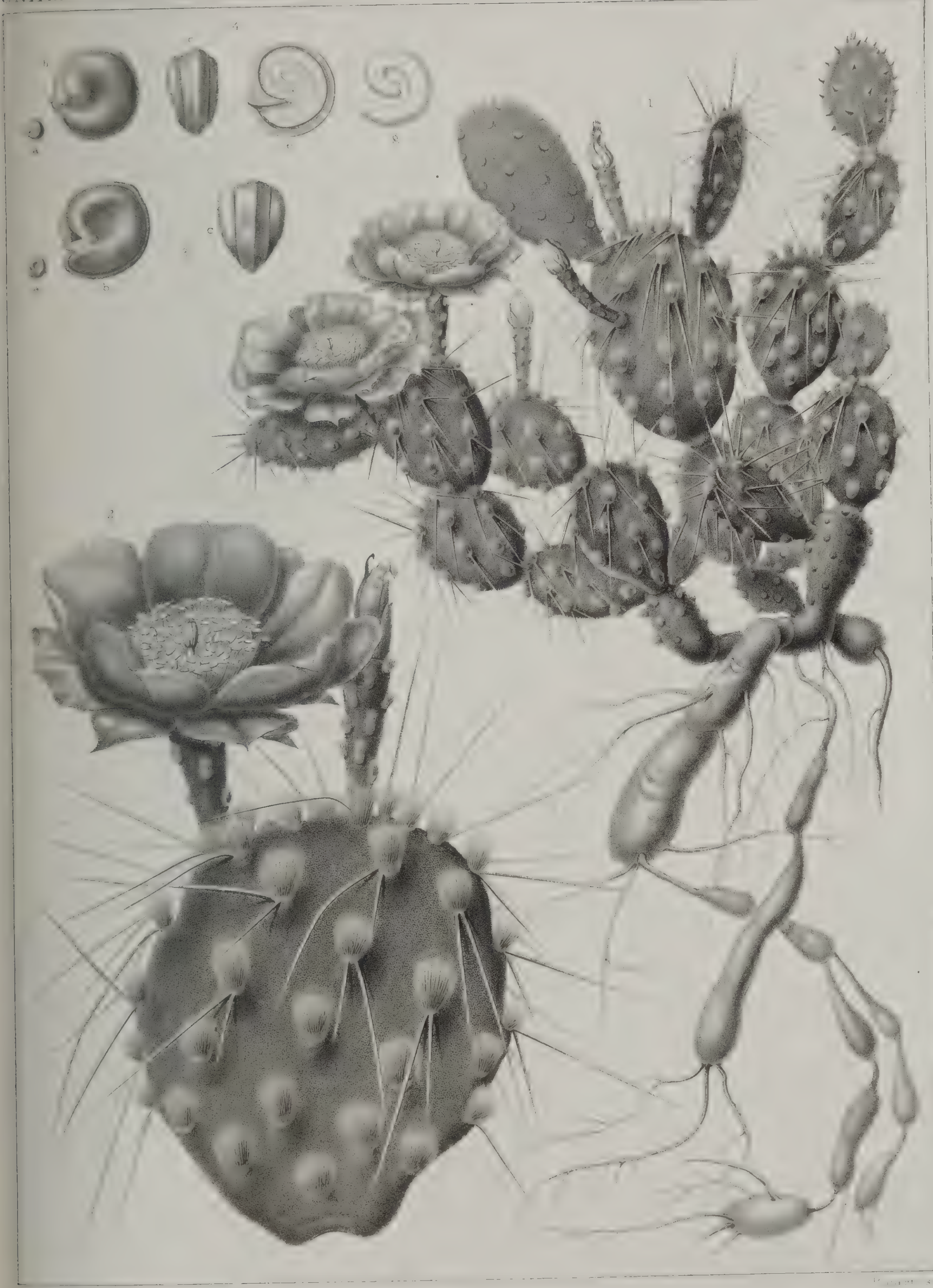
Dougal sc.

OPUNTIA STENOPETALA



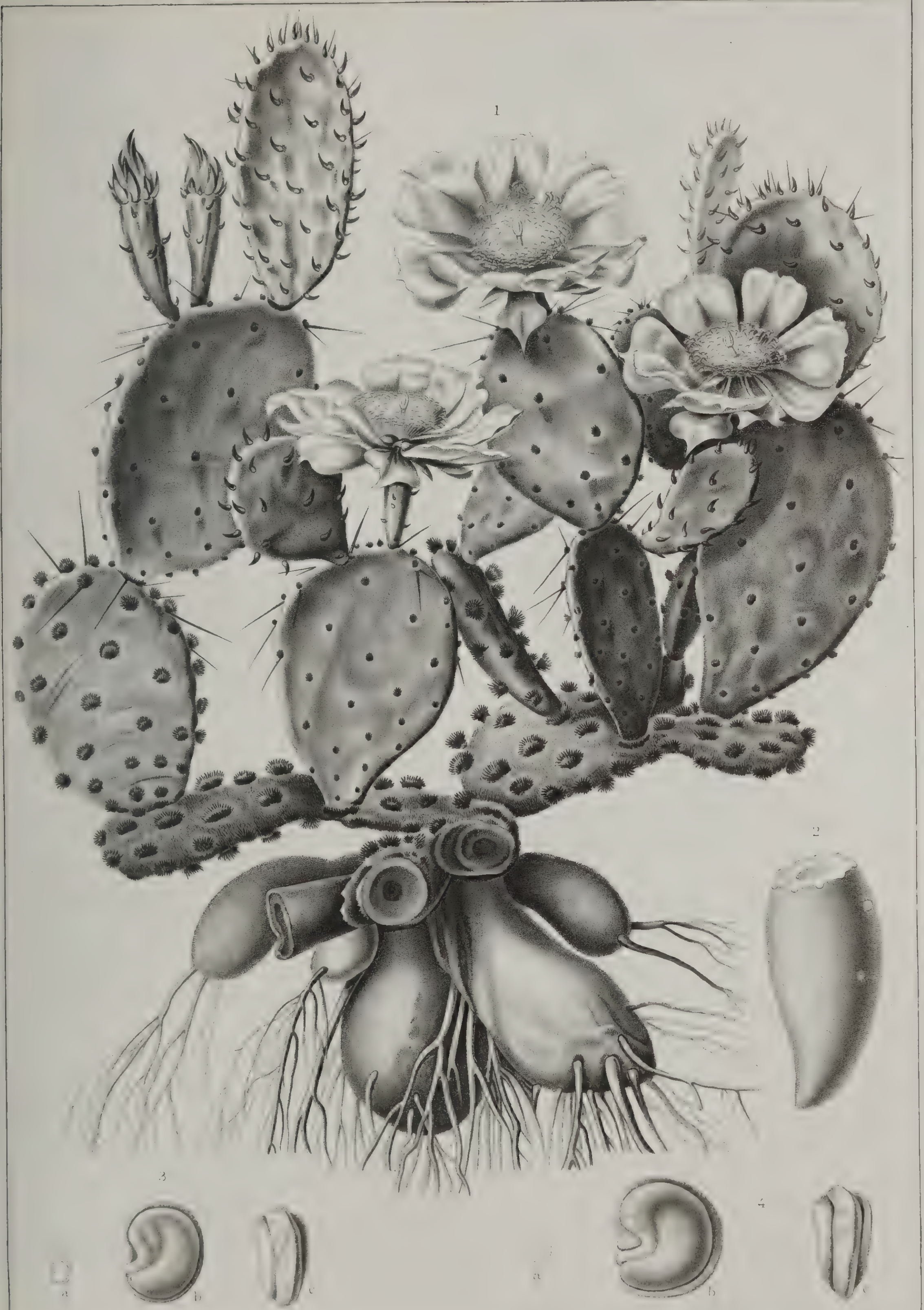
Roetter del Dougal sc.

OPUNTIA STRIGIL



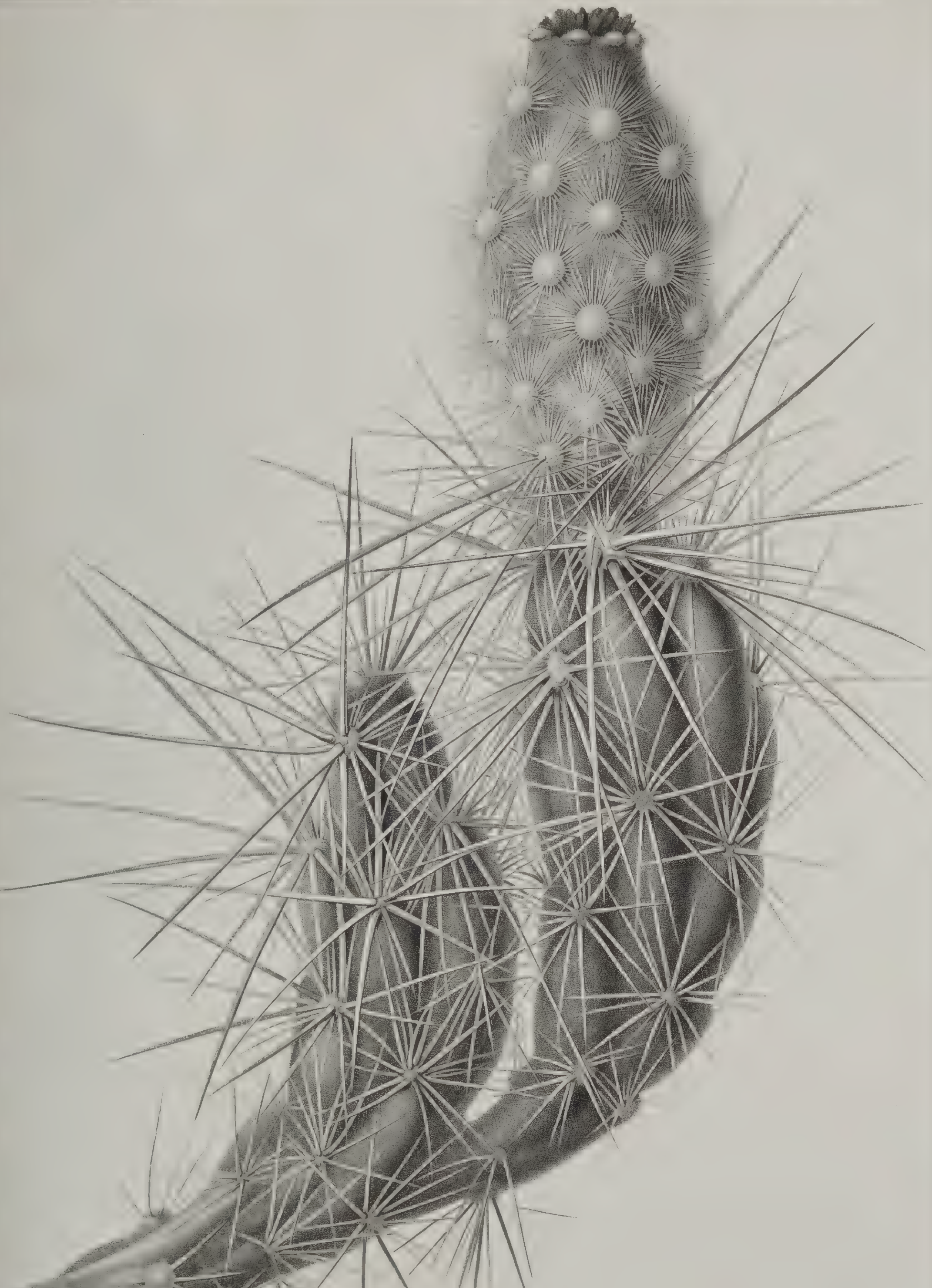
P. Roetter del

OPUNTIA FILIPENDULA



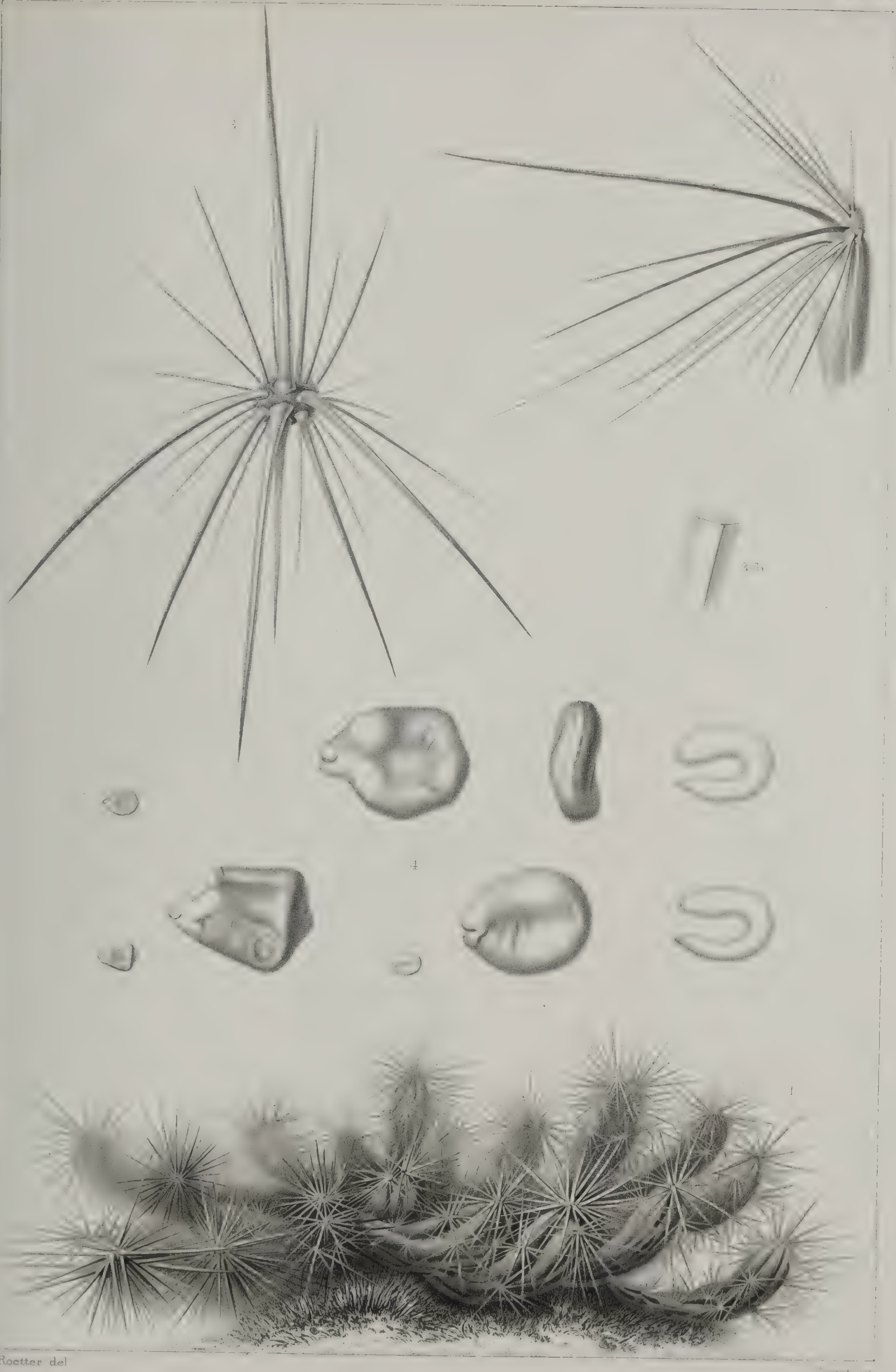
Roetter del. [illegible] sc.

OPUNTIA MACRORHIZA



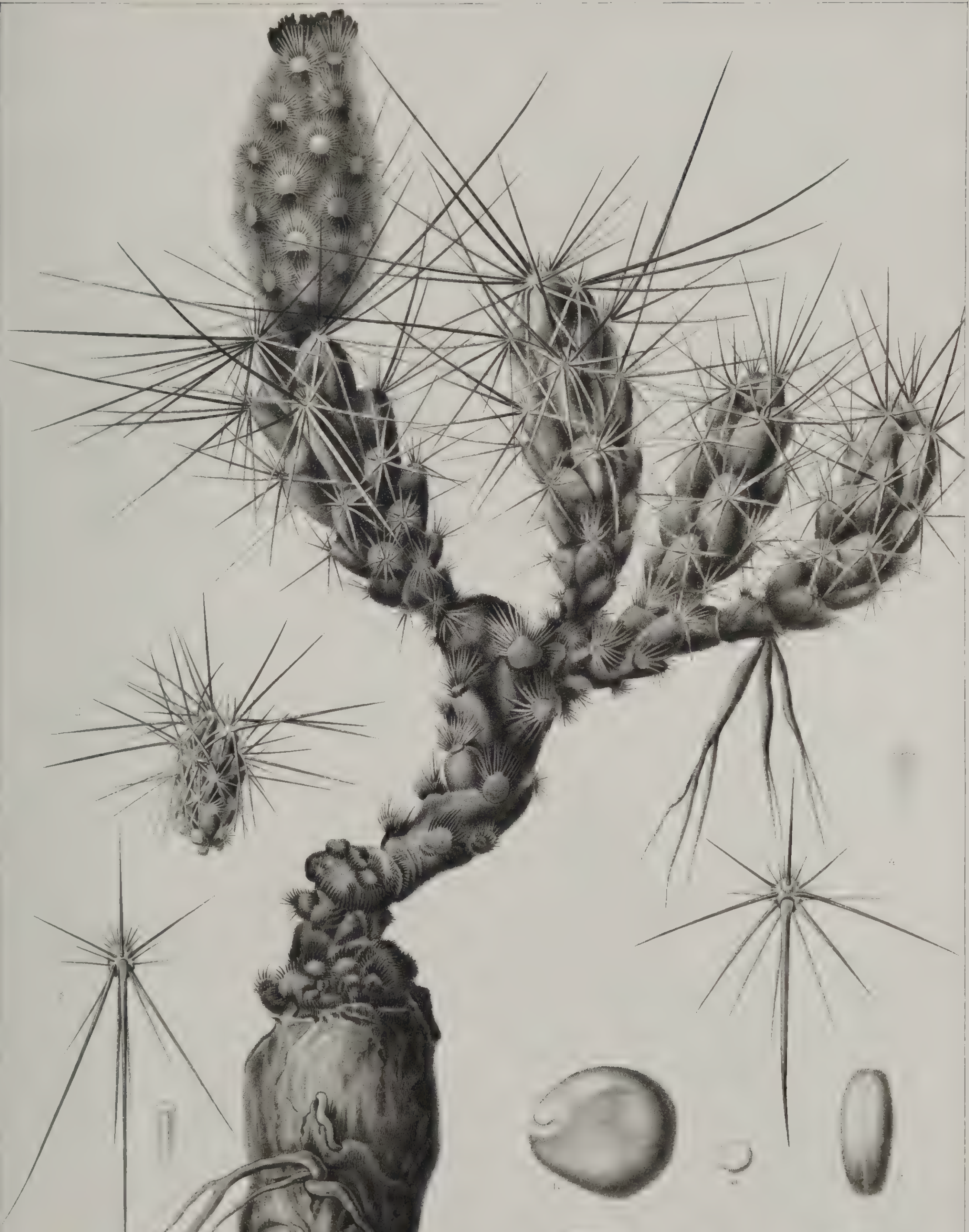
P. Roetter del. [illegible]

OPUNTIA EMORYI

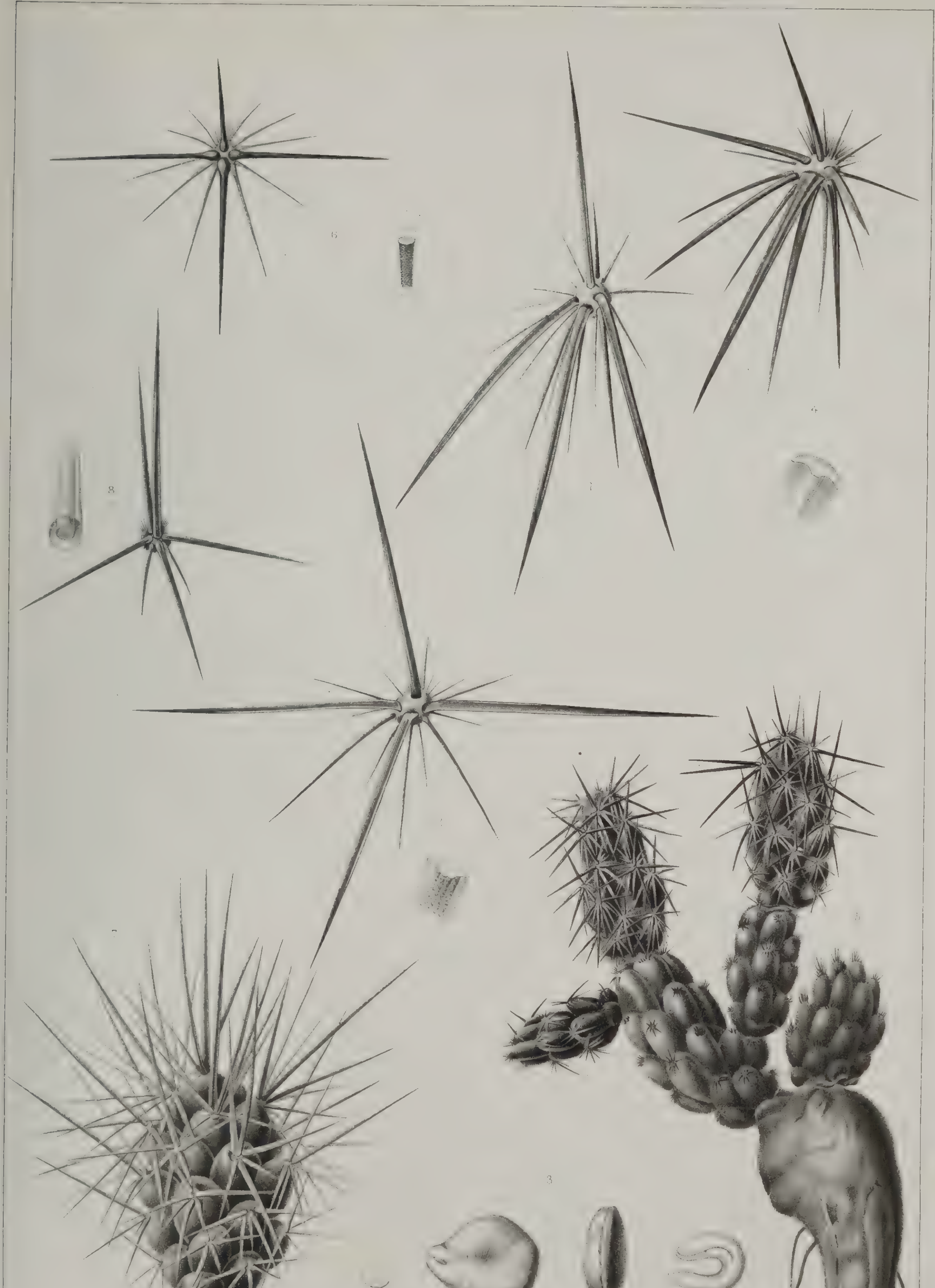


P. Roetter del

OPUNTIA EMORYI



OPUNTIA GRAHAMI

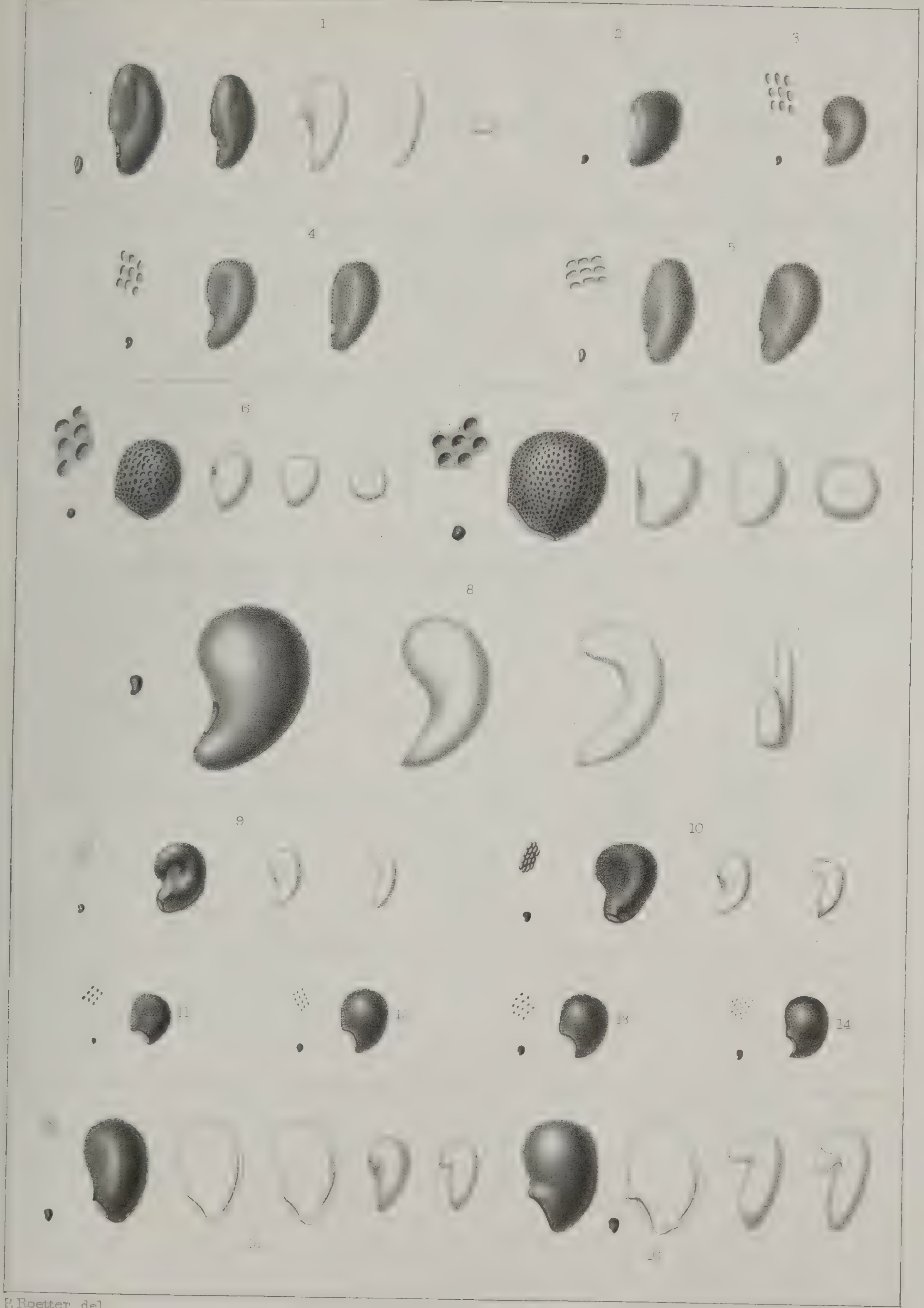


J. Roetter del.

Rebillet sc.

1-3 OPUNTIA SCHOTTII 4 VAR GREGGII

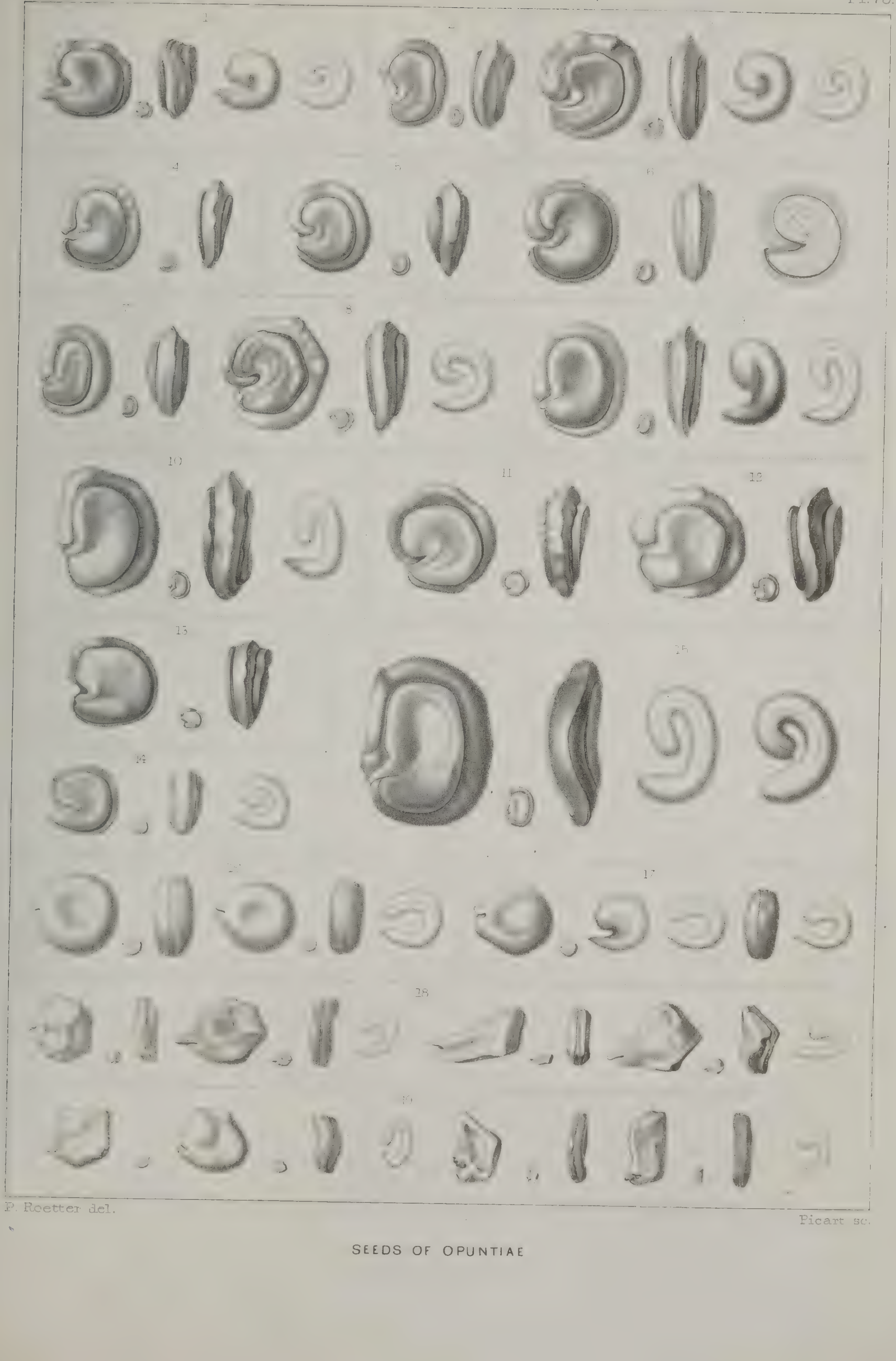
5-6 O BULBISPINA 7-8 O IMBRICATA



P. Roetter del.

Picart sc.

SEEDS OF MAMILLARIAE, ECHINOCACTI AND CEREI



P. Roetter del. Picart sc.

SEEDS OF OPUNTIAE

UNITED STATES AND MEXICAN BOUNDARY SURVEY. DEPARTMENT OF THE INTERIOR.

PART II.

ZOOLOGY OF THE BOUNDARY.

MAMMALS.	By S. F. Baird.
BIRDS.	By S. F. Baird.
REPTILES.	By S. F. Baird.
FISHES.	By C. Girard, M.D.

WASHINGTON:
1859.

UNITED STATES AND MEXICAN

BOUNDARY SURVEY,

UNDER THE ORDER OF

LIEUT. COL. W. H. EMORY,

MAJOR FIRST CAVALRY, AND UNITED STATES COMMISSIONER.

MAMMALS

OF THE BOUNDARY,

BY

SPENCER F. BAIRD,

ASSISTANT SECRETARY OF THE SMITHSONIAN INSTITUTION.

WITH NOTES BY THE NATURALISTS OF THE SURVEY.

REPORT ON THE MAMMALS.

ORDER

CHEIROPTERA.

Family **ISTIOPHORA.** Leaf-Nose Bats.

Ch.—Molars cuspidate; nose with a foliaceous or leaf-like appendage, in which the nostrils are situated.

The leaf-nosed bats are easily recognized among the other *Cheiroptera* by the presence of a peculiar appendage to the nose. This, instead of being simple, with two nostrils opening at the end or sides of the muzzle, as in ordinary mammals, is provided with a peculiar appendage of varied form attached to the extremity of the snout, and having the nostrils opening through it. There are four sub-families of the group, which may be characterized as follows:

a. Desmodina.—Molars presenting a longitudinal sharp edge, and of the minimum number, $\left(\frac{2-2}{3-3}\right)$. Nasal appendix without any upright leaf; the ears separated; a triangular bald spot on the end of the lower lip. Anal membrane short or none; tail wanting.

The species confined to South America.

b. Phyllostomata.—Molars cuspidate; ears separated; nasal leaf lanceolate, erect, (except in *Brachyphyllum.*) Inter-femoral membrane short; deeply excised; tail very short.

Of this group one species, *Choeronycteris mexicana*, is found in Mexico. All the others belong to South America. The assignment of a species, *Brachyphyllum cavernarum*, to South Carolina, as well as the West Indies, has not been substantiated by any American author.

c. Megadermata.—Ears large, united; tragus present.

It is in this group that the species I propose hereafter to describe is found.

d. Rhinolophina.—Ears large, separated; without a tragus.

The species of this group are confined to the Old World.

MACROTUS, Gray.

Macrotus, Gray, Voyage of the Sulphur.

Gen. Ch.—Nasal appendage with the leaf ovate, lanceolate, erect; inter-femoral membrane large; tail long; free at the tip.

It is to the genus *Macrotus* of the sub-family *Megadermata* that the first leaf-nosed bat ever positively known as an inhabitant of the United States belongs. It is true that the *Brachyphyllum cavernarum* of the *Phyllostomata* has been given as occurring in South Carolina, but the statement has never been verified by any of the large corps of excellent naturalists resident in that State, and is probably an error.

1. MACROTUS CALIFORNICA, Baird.—California Leaf-nosed Bat.

Macrotus californica, Baird, Pr. A. N. Sc. 1858.

The ears of this species are very large, scantily haired, ovate and rounded at the tip. Their outer edge extends forward to a little behind and below the eye; the inner anterior edge is partially free; the two ears are connected by a membrane, which takes its rise about one-twentieth of an inch behind the anterior free edge of the ear, and is united to the corresponding strip of membrane of the opposite side, so as to form a kind of roof over the middle of the head, the entrance posterior. The tragus is narrow, lanceolate, naked, one-third the height of the ear. The nasal appendage is short, but rather higher than wide, and extending on the side and beneath the nostrils as a narrow margin. It is coated rather closely with short hairs. The lower jaw is slightly fissured anteriorly, with a small narrow wart on each side the fissure; a groove or furrow extends from the fissure along each side the lower jaw.

The feet are entirely free, the spur about as long; the membrane extending between the spurs is slightly concave, leaving the extremity of the tail free for the last joint, or for about one-sixth its total length.

The general color is a pale brownish grey; darker above than below.

Length to occiput	1.00	Length of tragus	.42
Length to root of tail	2.60	Length of leaf of nose	.30
Length of tail	1.50	Wing from carpal joint	3.00
Length of ears	1.10	Fore arm	2.00

This species closely resembles the *M. waterhousii* of Gray, from the West Indies. It differs, however, in the longer tail and shorter appendage of the nose, as well as in the widely different locality.

2347. Fort Yuma, California. Major G. H. Thomas.

Family GYMNORHINA.

Ch.—Nose simple, without a foliaceous appendage embracing the nostrils; teeth cuspidate.

It is in this family that all the North American bats, with the exceptions above referred to, are found, although they do not embrace many different generic forms. The number of species is quite large, though not well ascertained, over thirty being recorded in the books.

In the great uncertainty attending the true characteristics of North American bats, as described, and the necessity of carefully identifying the species of the eastern States, I have been unwilling to attempt the description of the bats of western America at the present time. I have, accordingly, figured but two species; the one, *Macrotus californicus;* the other, *Vespertilio pallidus,* of Major Leconte; the description of which, taken from this eminent author, I subjoin.

2. VESPERTILIO PALLIDUS, Leconte.—Yellow Bat.

Vespertilio pallidus, Leconte, Pr. A. N. Sc. Ph. VII, Dec. 1835, 437.

"Upper Jaw. Incisors 1—1, large, simple. Canines 1—1, a little concave on the outer side, with an internal, basal, rather blunt cusp. False molars 1—1. Molars first and second, as in all the others; the third with four cusps, three of them transverse, the interior one smaller, and one posterior.

"Lower Jaw. Incisors. 4. False molars 2—2, the anterior one smaller, rather interior. First and second molarsas in others the third with three cusps, not transverse, the interior one larger, and transversely deeply emarginate.

"Hair light fawn colored, tipped with darker, beneath paler. Face hairy, dark brown. Nose rounded, emarginate. Ears longer than the head, oval, entire, very pale dusky brown. Orillon nearly one half the length of the ear, linear, blunt. Membrane thin, naked, brown. Inter-femoral, including the tail, except the two last joints.

"Length, 3; tail, 1.5; naked part, 1; extent, 12.1; head, 9; ears, .95; Orillon, 4."

Inhabits California.

"Differs from all the other species in having but four lower incisors; I hesitate, therefore, to arrange it with the Serinoid or Muroid Bats, and place it at the end of those two families."

Numerous specimens of this species were collected by the Boundary Commission in Texas, New Mexico, Sonora, and California. The one described by Major Leconte was taken at El Paso.

ORDER

INSECTIVORA.

3. BLARINA BERLANDIERI, Baird, (p. 53.[1])

Several specimens of this species were contained in the Berlandier collection, and are easily characterized by the above diagnosis. The species is described more at length in the report on the Zoology of the Pacific Railroad Survey.

2159. Matamoras, Mex., Lt. Couch.

4. BLARINA EXILIPES, Baird, (p. 51.)

A single specimen of Shrew, (631,) which I somewhat doubtingly refer to a species described in the report on the Zoology of the Pacific Railroad Survey, as found in Mississippi, was taken at Brownsville, Texas, by Capt. Van Vliet.[2]

631. Brownsville.

ORDER

CARNIVORA.

5. FELIS CONCOLOR, Linn. (p. 83.)—American Panther.

1355. Matamoras, Mex., Lt. Couch.—1148. Eagle Pass, Tex., A. Schott.—1005. San Elizario, J. H. Clark.—1110. Copper Mines, N. M., J. H. Clark.

"Panthers are found in greater or less numbers throughout the entire country traversed by the Boundary Commission. In Texas, along all the streams where there are thick bushes, it has been seen from the coast to the Rio Grande, at El Paso del Norte; and likewise from the latter place, in similar localities, was observed by us as far as Los Nogales in Sonora; in which State, the Mexicans, who call it *Leon*, wage against it an unceasing warfare, on account of the ravages which it commits among the cattle. It destroys very many colts and calves in that country, not very often attacking full grown animals. The most effective means used for their destruction, in the hands of the Sonoranians, is strychnine. They poison with this substance the carcases of the animals that have been slain, and not only often succeed in thus killing the *Leones*, but a great number of wolves also.

---

[1] The page referred to in brackets is that of the General Report on the Mammals of Western North America, forming the eighth volume of the series of Pacific Railroad reports, where the species are described at length, and their synonymy given in detail.

[2] A species of long tailed shrew or true *Sorex*, collected at Fort Bliss, Texas, by Dr. Crawford, was received too late to characterize in this place. A species of *Scalops*, (*S. latimanus*,) is described from Texas, by Dr. Bachman, but it has not fallen under my observation.

"Near Los Nogales, in the month of June, we pursued a female panther, which we succeeded in wounding very severely, the bullet having shattered the hind leg several inches above the ankle. It uttered a kind of howling cry, and fled as rapidly as it could, and disappeared. Six days afterwards we came very suddenly and unexpectedly upon this same animal, lying partly concealed in a fissure among the rocks. Although we were within ten feet of it, when we saw it with its mouth opened, showing its teeth in a very threatening manner, and uttering at the same time a deep growl, it did not offer to spring. As soon as it was killed, we observed the old wound. The weather had been warm and worms were busy in the place where the leg was broken, and the animal had become so emaciated as to lead us to believe that it had remained in that spot during the entire six days, certainly without food, and perhaps without water.

"Those panthers that we have observed were always found in the most solitary places, generally where there were thick bushes, and in the vicinity of rocky spots, affording caverns for secure concealment, and in which to bring forth their young. They always manifested great shyness, and fled rapidly at the sight of us, rendering it difficult to get within gun shot of them.

"On one or two occasions we have heard their cry in the night, when they seemed to be at a distance, but in sight of our camp fires."—(Kennerly.)

"*Felis concolor;* Cuguar or Panther, of the Texans; Leon, of the Mexicans; Chimbica, of the Cochimies of Lower California, Yutin, of the Apaches; Miztli, of the ancient Mexicans; Pagi, of the Chileños; Puma, of the Peruvians.

"A remarkable fact in respect to the panther is related by Clavigero, in his history of Lower California.—(See Book I, chapter 16.) According to this author, the puma exercised so severe a rule over that unhappy peninsula that the work of civilization, commenced by missionary Jesuits, never could rise above a certain elementary state. The missions and presidios established there, after years and years of labor, could never succeed in raising their own supply of domestic animals, but had to depend for that on the States of Sinaloa, Sonora, and other parts of the Mexican empire.

"The prodigious spreading of the 'Puma' over the peninsula of California seems to have been caused by a superstitious belief on the part of the natives there, who did not dare to kill or disturb this animal in any way. It became one of the missionary labors to gradually overcome and remove this singular notion. Indeed, the state of civilization among the California Indians has been so low that they in some respects depended on the success of the sporting puma. Thus Clavigero states that the hungry Indians used to watch the gathering of the buzzards, and searched the ground carefully whenever they observed a number of these scavenger birds, the acute scent of which leads them always unfailingly to the spot where some carcass was deposited upon or under ground By these means these miserable savages were enabled to discover the remains of a puma feast, which such a lordly beast, after the fashion of all the 'Felidae or Canidae' had hidden away here, and slightly covered with soil.

"In the regions of the Rio Bravo del Norte, and other sections along the boundary line, the puma acts a less prominent part. Here he is eagerly hunted by the white and red man, and especially by the cattle-raising sons of the half breed Mexicans.

"The numerous herds of wild cattle, mustang, mules, and horses, besides plentiful other game in the fertile valleys and table lands of the Lower Rio Bravo, Nueces, and other Texan rivers, form a rich support for a vast number of pumas and jaguars.

"The habits of the puma seem to be nocturnal, and it is during the hours after dark that his mournful note is heard resounding through the solitude of the deserts. The note listened to once attentively is apt to make a deep lasting impression.

"The different native names as pronounced in Spanish sound very appropriately to the note, and it is likely that the cry of the animal forms the base of its names. The note itself is often several times repeated, with intervals of from two to four minutes. As night time advances, the cry is heard but rarely.

"A puma was killed on the Rio Bravo, between Fort Duncan and Laredo. It was full grown and of considerable size, measuring from the nose to the insertion of the tail nearly four feet. This one was the head of a family, consisting of himself, a mother and two young ones. During his struggle with the hunters and dogs he raised a terrible cry, twice or thrice, to express his rage, and perhaps also to give to his family the notice of danger. The latter seemed to have retreated immediately after hearing the warning, as the hunters, after despatching the old one, could trace the fresh tracks of both the mother and the two young going down on the river side."—(A. Schott.)

FELIS ONZA, Linn. (p. 86.)—Jaguar; American Tiger.

This huge cat replaces on the continent of America the tiger of the Old World, as regards size and strength; little inferior to it in these respects, it is, however, less dreaded by hunters.

The specimens at present before me do not permit any very accurate description of the species, except as to its color. One of these is from the Brazos river, Texas; the other from Brazil. In the former, the ground color of back and sides is of a pale golden yellow, of the belly white. The top and sides of the head, neck, and shoulders, the legs all round, and the belly, are marked with full black blotches, smaller on the top of the head, sides of neck and shoulders; larger on the outside of the legs; largest on the belly and inside of legs. The top of the muzzle is unspotted brownish yellow. Just back of the shoulders on the dorsal line are one or two large blotches, with central light spaces; beyond this, and extending to the tail, is a vertebral series of elongated blotches, more or less confluent, and in contact, and with little or no trace of lighter centres. On each side of this line, the sides of the body are seen to be occupied by several series of large angulated blotches; the exterior black, and more or less interrupted, inclosing an area of the ground color, with from one to four spots of black. No difference of color between the centres of these blotches and the intervals between adjacent ones is discernible, as in the ocelot. There may be traced from three to five series of these blotches on each side of the vertebral line, and they may be made out to occupy the meshes of an irregular reticulation of ground color, and are sometimes alternate, sometimes opposite. The tail is marked with elongated blotches on a yellow ground; towards the tip, however, it assumes the appearance of being black, with transverse light bars. The convexity of the ear is black, with a white blotch.

The Brazilian specimen is much the same with that above described, except that it is considerably larger, and with more red in the ground color.

This species differs in the pattern of coloration from the ocelot, in being without the lines or stripes on the head, upper surface of neck and limbs, these portions being provided with small simple blotches, occasionally elongated. The anterior half of the tail is irregularly blotched, the posterior half only being like the entire tail of the ocelot, black when viewed from above, with transverse light bands. The sets of spots are more regular and distinct, and less elongated than in the ocelot; the intervals between the sets of blotches are of the same color with the centres of the latter, instead of being lighter.

This species is found through the greater part of eastern Texas, extending as far as Red river. It is quite probable that specimens have been killed within the limits of Louisiana, as at present constituted. Southward it ranges through Brazil (where it is abundant) and Paraguay as far south as the Rio Negro.

"This large cat, so common in southwestern Texas, especially along the lower Rio Grande, is rarely seen so far north as El Paso del Norte. The only individual observed by our party west of the latter place was seen in the Sierra Madre, near the Guadaloupe cañon. However, we were assured by many persons of Santa Cruz that it was very common near that village, in the valley of the river of the same name."—(Kennerly.)

Jaguar, tiger, leopard of the Texans; tutinquillḗ, of the Apaches; tigre, of the Mexicans.

This powerful rival of the puma equals the latter in size and muscular strength and elasticity in the use of its limbs. The habits of both coincide almost entirely, perhaps with the exception that the jaguar confines itself rather to more covered regions, preferring the impenetrable thickets in the river bottoms. Here he lies in wait for his prey, especially on the watering places of mustangs, wild cattle, and deer. Its less extensive geographical distribution, however, gives the jaguar a minor importance when compared with the puma.

As far as my knowledge extends, the head of the Rio Bravo, with the surrounding country, is the northern limit of th jaguar. The westernmost specimen of the genus was seen in the Guadaloupe cañon (Sierra Madre) by Mr. J. Weyss, one of the assistants of this commission.

Many stories about the ferocity of this animal are told among the inhabitants of the western regions, but none substantiating the fact that a jaguar unprovoked will attack man. In the annals of the convent of San Francisco, in Santa Fḗ, a bloody occurrence is recorded which contains some indications of the jaguar's nature.

The following is an abridged translation from the Spanish:

"On April 10, 1825, a lay brother, after having made confession and concluded his prayers, entered the sacristy. There he was terror-stricken on opening the door and seeing himself almost face to face with a jaguar (tigre) of very extraordinary size.

In a moment the poor man was in the clutches of the beast, which dragged its victim into a back corner to finish the bloody work. The guardian of the convent, on hearing the exclamations in the sacristy, hurried to enter the fatal room, and had scarcely become aware of what had happened when the animal leaped upon his second victim and despatched him with the same promptitude as the first. After a while several other men attempted to enter the bloody sacristy, but not without meeting a similar fate, for the first one opening the door was immediately slain. A senator, Mr. Iriondo, being present, tried now to approach the sacristy by an adjoining back room which communicated with the former by a small door. The jaguar, however, had left the sacristy in the meantime through that very door which Mr. I. wanted to use, and before the latter, followed by a small crowd, could enter it, he heard the cries, "here he is! here he goes! save me!" With this the roaring of the jaguar was heard, and mingled with it the last exclamations of a fourth victim. Each party now retired, the convent people to the church, and the jaguar to where he had chosen his first stronghold.

"Mr. I. now approached and bolted the door of the sacristy opening into the church, making the least noise he could. A hole was then bored through the door, and finally the crowd succeeded in shooting and killing the dreadful monster through the opening thus prepared."

Some explanation is necessary to make more intelligible this almost incredible occurrence. The convent of San Francisco, in Santa Fé, is situated upon the banks of the Rio Bravo, which, after freshets, occasionally overflows the islands in front of the town. During one of these overflows all the animals living in the thickets upon the island seem to have been driven out; among them the above jaguar, which made for the town side, where he entered the gardens of the convent. A low wall only encircles the latter towards the river. From the gardens he entered a small door, accidentally left open, and so came through an old back vestry to the sacristy. At the time his first unfortunate victim entered the sanctuary from the church side the animal was perfectly aware that his retreat was cut off by the river flood, and thus found himself forced to the desperate attack upon a man, which he was likewise compelled to repeat several times.

The largest jaguar skin which I saw was taken from a specimen killed near the mouth of the little stream Las Moras, above Eagle Pass, and measured nearly five feet to the insertion of the tail.

7. FELIS PARDALIS, Linn. (p. 87.)—Ocelot: Tiger Cat.

Sp. Ch.— Size about that of the American wildcat. Tail not half as long as the body and neck (exclusive of the head.) Ears black, with a white spot. Tail above black, with narrow bands of white; five stripes on the back of neck, with lighter intervals; a dorsal series of full black blotches, sometimes more or less continuous; the rest of back and sides showing a grayish network inclosing angular blotches more or less elongated, black externally, brownish yellow in the centre; those blotches next the dorsal line more serial and smaller.

In size this animal about equals the Texan lynx, weighing rather more than the common *Lynx rufus*. The skull is decidedly longer, its general form not dissimilar to that of the common cat. The fur is short, close, and glossy. The legs are rather long. The ears are large, rounded at the apex, nearly naked around the meatus, around and anterior to which are numerous bristly hairs. The convexity of the ear is covered by a short velvety fur. The whiskers are in four principal horizontal series, the lower ones white, the upper brown. There are naked pads under all the four toes of the four feet, with a larger central one on the under surface of the latter, or five to each foot. On the fore feet there are two additional naked spots above the palmar pad. The tail is nearly cylindrical, tapering slightly to the end, which, however, is blunt; it is covered uniformly all around with hair. In the prepared specimens the tail is less than half the length of head and body together (about two-fifths.)

The general character of the ground color is a dull brownish yellow mixed with dusky; in some specimens there is a more grayish tinge. On this ground is a series of blotches and ocelli of black, sometimes more or less rounded, sometimes much elongated; on the side the spots are included in the meshes of an elongated reticulation of gray; beneath, the color is white, with larger full blotches of black, faint on the lower belly. The legs are spotted all round with full blotches of black, which, on the inside of the fore legs, assume the character of transverse bars. The tail, viewed from above, appears to be black, with six or eight transverse bars of grayish white; these, however, are generally blotches on the upper surface, which sometimes pass around as annuli to the lower surface, and are there interrupted by a narrow break; sometimes they are alternated beneath by other blotches.

The precise pattern of coloration on the body and head is difficult of expression, and varies somewhat with the specimen. The edges of the orbit and the anterior canthus are dusky; the eyelids again and a spot above the anterior canthus are yellowish white. The insertion of the whiskers is shown by four horizontal series of black dots. There is a narrow black stripe, commencing below and parallel with the lower eyelid, and converging posteriorly a little towards another starting from the posterior canthus of the eye. There are several blotches on the side of the neck below the ear, and a row of the same passes across the throat below the occiput, sometimes forming a complete gorget. Starting a little above the eye is a quite distinct black stripe, (those of opposite sides nearly parallel,) and passing to the occiput inside of the ear; between these, on the forehead, are four or five linear series of blotches more or less continuous; the upper part of the muzzle, however, is uniform brownish yellow. The ears are black on their convexity, with a white spot near the posterior margin; the hairs on the concavity of the ear are of a dirty white. On each side of the neck above is a curved black stripe, the convexity downwards; between these are three others nearly straight and parallel, one of them median. They all have the central line (or about one-third) of the light yellowish ground color. On the sides of the neck are a few elongated full blotches, and beneath some few rounded ones in the white ground.

There is a vertebral series of rather angular, elongated full spots of black, which are sometimes continuous for a space, then interrupted. On each side of this may be traced pretty distinctly a series of angular blotches, the centres of the much lighter ground color, and on the sides exterior to these are still larger and more irregularly disposed ocellated blotches, with a greater amount of paler centrally, the black border sometimes not continuous, and occasionally with small full spots of black on the central ground. The intervals between these areolated blotches are lighter and purer than the centres of the blotches themselves; indeed, in one specimen, there is a quite distinct and pretty regular reticulation of grey, with the meshes occupied by the blotches described, namely, an exterior of black enclosing an area of dusky brownish yellow, with an occasional black blotch. On the shoulders are several oblique black lines, and sometimes there are transverse lines of the same on the exterior of the arm.

Measurements.

Point of nose to root of tail, 27 inches; tail to end of vertebrae, 10.50; tail to end of hairs, 11.00; ear above skull, 1.50.

The largest skull I have seen (1358) is 5.30 inches long and 3.46 inches wide.

This species is readily distinguished by its smaller size from the jaguar, the only other spotted cat with long tail inhabiting the United States. There are, however, several species of nearly the same size in South America, to which it approaches more or less. *Felis macrura* or *oceloides*, with somewhat similar markings, is of considerably less size, (not larger than a house cat,) and has a tail as long as the body, (exclusive of the head,) instead of being not half this length. This species occurs in Brazil, where it is very common. The *Felis tigrina* of the Amazon is also a much smaller animal, with about the same length of tail, and the markings resembling more those of the jaguar. *Felis mitis*, so abundant in Southern and Central Brazil, comes much closer to it than any, and is distinguished with some difficulty; it is, however, a smaller animal, lower on the legs, not so much blotched beneath, and the spots on the sides separated by longer intervals and scarcely arranged in series.

Whether or not the present species should bear the restricted name of *Felis pardalis* can only be ascertained from an examination of a large number of South American specimens. Several names of supposed distinct species—as *F. catenata*, Griff.; *F. armillata*, Cuv.; *F. chibiguzu*, *F. griffithii*, Griff., &c.—are usually considered as mere varieties of one.

The skull of the ocelot in general shape is not dissimilar to that of the panther or cougar (*Felis concolor;*) it lacks, however, the depression of the skull at the posterior extremity of the nasal bones, nor are there any traces of the dove-tailed wedges sent up from the parietal bones into the frontal. The post orbital processes are longer, the sides more nearly parallel, and the sides more perpendicular to the major axis of the skull. The upper outlines of the skull are quite similar. The incisive foramina of the ocelot are larger and longer, extending as far as the anterior edge of the canines. The upper canines of the ocelot are more compressed than in the cougar, and have four distinct longitudinal grooves externally. There is but little difference in the shape of the other teeth; the second premolar is perhaps shorter and higher in the cougar. The deciduous dentition is also very similar; the most anterior of the two forward tubercles of the second molar longer perhaps in the ocelot. The coronoid process of the lower jaw is higher, narrower, and with less concave outlines behind in the ocelot. There are also but two distinct foramina on the outside of the jaw below the vacant space separating the canine from molars, and these are in a horizontal line, and sometimes confluent in one, while in the panther there is a third one, equally distinct, above the anterior one of the horizontal series.

29. Eagle Pass, Texas. Col. S. Cooper.—129. Eagle Pass. A. Schott.—255. Matamoras. Lt. Couch.

Tiger cat, Leopard cat of the Texans.—" This beautiful cat, though quite common through the western wilds, was met by our party but once on the lower Rio Bravo. The dogs started it first and 'treed it,' as the hunters say. One or two pistol bullets, however, drove it down again, to seek a safer place in a dense nopal thicket, a common resort of persecuted animals.

" In taking off the skin of this specimen I found its inside all over covered with opuntia prickles, which, naturally barbed as they are, had worked themselves in with the movements of the skin. The animal, however, did not seem to have suffered any, by this otherwise dreaded annoyance, for all the prickles lodged themselves horizontally or in an oblique direction into the skin, so that the points would not reach the muscles and nerves. I observed subsequently the same circumstance on other animals, which accounts for the readiness with which they take to these bushes, unapproachable for men.

" As the ocelot is but a small robber, his importance in regard to the development of civilization stands in a strict proportion to the size of the game he is preying on. He is, however, eagerly hunted for the sake of his beautiful fur.

" Almost every western trapper, of both the white or red race, has something of his professional outfit adorned or made of an ocelot's s k

" One or two dollars are paid for one, and this is also about the price of a Jaguar or Puma skin."—A. SCHOTT.

8. FELIS EYRA, Desm. (p. 88.)—Tiger Cat.

SP CH.—Size of the house cat, but neck longer, and general form more musteline. Tail rather longer than the body, exclusive of the neck and head. Color uniform brownish red, a little paler beneath. (Hairs not mottled?)

The introduction of this species into the fauna of North America is based upon a skull in the Berlandiere collection, together with a short description and figure by Dr. Berlandiere. Although not entirely certain that it is the true *F. eyra*, or that the *F. unicolor* of Traill is the same animal, yet, in the absence of fuller data, it will be safe to consider it for the present as the *eyra*. According to Dr. Berlandiere the animal is "entirely rufous, the head small, ears short, without tufts, body long and slender, tail long. Size of common cat, but longer. Inhabits the desert regions of Tamaulipas, where it is called *onza* and *apache*." He further adds that it is found in the shrubbery along the Rio Grande, near Matamoras, although very rare. The specimen described, to which the skull (1373) probably belongs, was a female, taken very young and kept in captivity a good while without ever becoming entirely tamed.

The figure of Dr. Berlandiere represents the animal as a uniform light reddish brown, without any spots whatever, and no lightening of tints beneath. The ears are rather pointed. The tail is slender and tapering gently to the tip, which is not tufted. The tail is rather longer than the body, by about half the length of the neck. The figure also represents the pupil as vertical; other authors describe the pupil of *F. eyra* as round.

The whole form of the animal is very musteline, as shown both by the skull and the figure. The skull is about as long as that of the common cat (the brain case rather more capacious), but is more elongated and narrower between the zygomata. The neck also is very long

According to Burmeister the *Felis eyra* is of a clear yellowish red, paler on the belly, the upper lip white, the iris greyish yellow brown, the pupil round. The head and body measure one and a half feet, the head alone three inches, the tail one foot; height anteriorly ten inches, posteriorly one foot. It occurs throughout Guiana, Brazil, and Paraguay, and by the present identification, as far north as the Rio Grande of Texas.

	Felis eyra.	Large *house cat.*
Length of skull (1373)…………	3.55 inches.	3.55 inches.
Width of skull…………	2.33 "	2.61 "

The skull of *Felis eyra* is about as long as that of the domestic cat, but considerably narrower and more musteline in appearance. The muzzle is narrower, and the zygoma extends further forwards, so that its anterior extremity falls a little in advance of the second premolar instead of within it, as in the cat and ocelot, and still more in the panther. The free portion of the zygoma anteriorly is narrower than in the cat, and the ante-orbital foramen is double in the specimen instead of single. The flattened portion of the crown is of considerable extent, and reaches to the middle of the nasals, instead, as in the other cats, of involving only the posterior extremities of these nasals. The top of the muzzle is broader, and the sides are much less pinched in and more vertical. Viewed from above the zygomata are nearly straight in lateral outline, the lines converging so as to intersect in front of the incisors at a distance of about two-thirds the length of the skull. The post-orbital process of the frontal and malar (the two almost meeting) are much more anterior in this species than in the house cat. The auditory bullae are more compressed. The occipital foramen, instead of being angular above, is gently curved, the whole representing a regular ellipse, the rather larger diameter transverse. The occipital condyles are larger and more acutely convergent. The occipital outline is less triangular, more pentagonal.

The rami of the lower jaw are narrower than in the house cat; the coronoid process, on the contrary, is higher, broader, and straighter behind.

The outer incisors are larger than in the house cat, the interval between the upper incisors and canines less. The third upper premolar is larger than in the house cat; the central and anterior lobe occupying a rather larger proportion of the tooth; the horizontal section of the tooth is a right angled triangle, the right angle internal, while in the cat it is external. The inner anterior tubercle, so prominent in the house cat, is here almost entirely wanting, resembling the panther more than the ocelot or cat.

The following notice of the present species is taken from Dr. Berlandiere's manuscript:

"This animal, by some called *onza*, by others *apache*, is extremely rare in Mexico, where I have only seen it in the interior States of the east. In the State of Tamaulipas it is found in the shrubbery which grows on the shores of the Rio Grande del Norte. The specimen which I have described is a female, and was given to me when very young. I tamed it, without its losing altogether the habits of its kind, especially when in sight of some prey. It had attained the size of a cat, but was more elongated and slender. In every movement it exhibited great lightness and activity, of which we had many proofs. This digitigrade was in the habit of purring like a cat."

9. FELIS YAGUARUNDI, Desm. (p. 88.)

Sp. Ch.—Larger than the largest common cat; much more elongated in its proportions Tail as long as the body, exclusive of neck and head. Prevailing color a continuous grizzled brownish grey, without any spots. Hairs annulated, and tipped with black. Young rather more rufous.

The existence of this species on the Rio Grande, like the *F. eyra*, is established by a skull (1426) in the collection of Dr. Berlandiere, and a description in his MSS. as *Felis cacomitli*. According to him, "the animal was common in Mexico before the conquest, but is now rare; it is somewhat abundant about Victoria, and a few have been killed on the Rio Grande near Matamoras. Its general tint is greyish, but the hairs, considered singly, are annulated with rufous and black, the tips blackish. It is about the size of the *Felis pardalis*, or ocelot. The female, killed in December, had milk in her teats."

Dr. Berlandiere speaks of this animal as being as large as the ocelot. In judging from the skull, however, it is not much more than half as large, and about one-third larger than the Berlandiere skull of *Felis eyra*. According to Burmeister, the *yaguarundi* is a little larger than the *F. eyra*; of a continuous blackish brown grey; each hair has light ash grey at the base, annulated, and broadly tipped with black. The lips and paws are lighter, the greyish predominating; the whiskers are brown. The iris is brown, but lighter than the fur; the pupil round. Dimensions as *F. eyra*, but the head longer, (3½ inches.)

Skull.—The skull of the *Felis yaguarundi*, in general shape, exhibits a close relationship to that of *F. eyra*, and, like it, much narrower and elongated than in the *Felis concolor* or *pardalis*; calling to mind the mustelas as much as the cats. Like the *eyra*, the top of the head is quite plane and broad; the upper outline curves rapidly from the occiput to above the glenoid cavity; it then slopes downwards almost straight, or slightly concave, to above where the orbital process of the frontal bone begins to spring anteriorly; then making a distinct but very obtuse angle, sometimes in a straight line to the anterior extremity of the nasal processes of the frontal, then makes another angle and slopes rapidly downwards, still in nearly a straight line, to the end of the nasals. The chief peculiarity of the species is seen in the projection forwards of the upper part of the muzzle, so that a line dropped from the extremity of the nasals perpendicular to the plane of the palate would fall very nearly in the centres of the incisors. A similar line in the ocelot, or domestic cat, would fall within the canines. The posterior edge of the intermaxillary, or its suture with the maxillary, is in nearly a straight line, at a right angle, or even more, with the plane of the palate. The sides of the muzzle above, also, are elevated, compressed, and deeply concave, as if squeezed, when soft, between the finger and thumb. The posterior portions of the nasal bones are rather short, and broader than in the ocelot; there is a very decided longitudinal depression in the forehead along the insertion of the nasals between the frontals, as in the cougar. The post-orbital processes are long, and extend perpendicularly outwards and downwards at a more acute angle than in the ocelot. The plane of the zygoma, anteriorly, is more vertical than in the ocelot. The lower jaw is rather short and broad; the coronoid process low and broad, much less attenuated and curved backward than in the ocelot and cat, and broader and less angular than in the *F. eyra*. The skull differs further from that of the *eyra* in the narrower nasal bones, the muzzle projecting more above, and more deeply indented on the sides, and narrower.

The teeth differ from the ocelot, cat, and cougar in the same features as do those of the *F. eyra;* the third upper premolar or sectorial tooth is weaker, and its anterior inner tubercle is nearly obsolete, the tooth sloping rapidly over the fang. The inner angle of the triangle formed by the horizontal section of this tooth is the rectangle instead of the outer, as in the ocelot. Only one groove is visible on the exterior surface of the canines.

Length of skull, (1426,) 3.92 inches; width, 2.49 inches.

This species, according to authors, is found from Paraguay to Mexico, a specimen from the latter country being given by Wagner, as in the Wurzburg Museum. It varies in size, according to different authors, measuring from 22 to 30 inches in the body, (and neck 3,) and from 13 to 24 inches in the tail. The tail is thus about as long as the body, exclusive of the neck.

From the skull, it would appear that the general form, like that of the *F. eyra*, is more musteline than that of the other American cats.

The largest specimens come from Surinam, and it is not impossible that close comparisons may show the existence of two species.

For the introduction of this species, as well as many others, into the fauna of N. America, science is indebted to the liberality and zeal of Lieut. D. N. Couch, of the U. S. army, in purchasing the entire collections of Dr. Berlandiere, and presenting them to the Smithsonian Institution.

"A kind of cat, or at least digitigrade, common in Mexico before the conquest, but at present very rare.

"It is grey, but the hairs considered separately are tinged with rufous and black; their extremities blackish.

"I have been assured that it is killed sometimes in the vicinity of the city of Victoria, the capital of the State of Tamaulipas, and on the plateau of Mexico. On the borders of the Rio Bravo del Norte it is killed in the vicinity of Matamoras. I believe it is not found in Texas."—(Berlandiere.)

10. LYNX RUFUS, Raf. (p. 90.)—American Wild Cat.

This species is abundant in the northern part of Texas, but it is not yet ascertained how far south its range extends.

11. LYNX RUFUS, var. MACULATUS, (p. 93.)—Texas Wild Cat. Called *Gato montis ravin* by the Mexicans.

123. Eagle Pass, Texas. April, 1852. A. Schott.—132. El Paso, Texas. C. Wright.

"*Short-tailed cat of the Texans; gato montes of the Mexicans; no-mē of the Yuma Indians; Chimbi, Cochimies of Lower California.*—In the sierras of Pimoria alta (Sonora) this lynx seems to be quite common, and as we found traces and specimens of it also on the lower Rio Bravo, we may consider its range going from ocean to ocean. The Spanish name of this species points also to its more extended vertical range.

"Our collection contains two specimens, mother and daughter, from the Sonorian mountains, near Fort Yuma, and one individual from the lower Rio Bravo, near Laredo.

"Of the first two specimens, the young one was killed first on the verge of a rock; the instant it fell the mother appeared for its defence, but quickly shared the same fate. The one from the Rio Bravo del Norte appeared one afternoon in front of our camp, on the other side of the river, but on seeing us retired instantly. Our hunters, however, crossed the river, and brought the dogs on the scent. They took the only outlet of a narrow bottom, which was hemmed in all round by vertical banks. Thus the sport was sure, of which the poor victim became soon aware. Besides the barking of the dogs, we heard the valley resound three or four times with the lynx's fighting call. This note, which was furiously thrown forth, was loud and abrupt. It resembled very much, on a smaller scale, the roar of the puma under similar circumstances."—(A. Schott.)

12. CANIS OCCIDENTALIS, var. MEXICANUS (p. 113.)—Lobo Wolf.

This wolf is of quite large size, with a rather narrow head. The ears are large and thickened, rounded at tip, more so than in a skin of *Canis nubilus*, and with a greater amount of hair in the cavity. The feet are large, the pads broad, and of considerable surface. The tail is rather long, exceeding half the length of body and neck without the head; it is covered with long hairs, but is not very bushy, owing to the comparative deficiency of soft fur. The hairs between the shoulders and on the anterior of the back are much longest, and form a kind of mane.

The prevailing colors of this species are a dirty yellowish or dull rusty whitish, with cloudings of pure black, the hairs on the back and upper part of the sides being largely tipped with this color. The lower part of the sides and the under parts generally of the body and tail do not show any black tips in the whitish ground. The throat, however, exhibits a very distinct collar of black caused by dusky tips to the hairs.

The head exhibits a good deal of black shading in the greyish ground. The edges of the lip and the under jaw are dark dusky. There is a decidedly rusty tinge in the ground color of the muzzle, which again reappears as a paler tint in the crown and around the adjacent bases and convex surface of the ears. The band on the throat referred to is five or six inches long, and just in front of the shoulders; it is produced by black tips to the hairs as on the back. The black shading on the sides of the neck is continuous with this, and together they encircle an unmarked space on the upper part of the throat.

The legs are rusty white, deepest on the carpus and on the posterior part of the hind leg. On the fore leg is a narrow dusky longitudinal line of mixed black and greyish hairs, forming a conspicuous mark. There is no evidence in the present condition of the skin of fasciae on the sides of the body.

The tail, like the rest of the body, is greyish white, with the heirs on the upper part and extremity largely tipped with black. There is less of this on the sides, the lower portions of which and the entire under surface are uniform yellowish gray white, except near the tip.

The base of the under fur is rather light brownish plumbeous, varying a little with the region of body; the terminal portion shades into dull yellowish grey, with a tinge of rusty along the back. The long hairs where the black appears are mostly black with a varying central portion greyish white, and sometimes with the extreme base of this color. The black tipped hairs of the tail show this color only on their terminal portion.

$\frac{1050}{193}$. Santa Cruz, Sonora. Dr. Kennerly.

Measurements.

Length from nose to root of tail, (skin much shrunken)	36 inches.	Foot from carpus	6¼ inches.
Tail to end of bone	14 inches.	Hind leg from heel	9 inches.
Tail to end of hairs	18 inches.	Longest hairs on back	4½—5 inches.
Ears along anterior margin	3½ inches.	Length of skull	8½ inches.
Greatest breadth	2¾ inches.	Width of skull	4½ inches.

In the preceding account will be found the description of what is referable to the *Canis mexicanus* of authors; whether, however, the species is really distinct from that which inhabits the greater portion of North America, I am not able to state. The black chin and dusky collar I have not seen in any other specimens, nor are they mentioned in the descriptions of authors. It will be noticed, however, that the longitudinal stripe on the fore arm, supposed to be a characteristic of the European wolf, is present in this specimen.

The lobo wolf, described in the Berlandiere MSS. as *Canis torquatus*, differs in some respects from this, although agreeing in the main. The skull of Dr. Berlandiere's specimen (1379) is smaller than 2193, but similar in all essential features.

"Near Santa Cruz, in Sonora, we found this animal more common than we had observed it elsewhere on our route. It, as well as the coyote, were often destructive to the flocks around the village. It often, too, attacks the young cattle, both domestic and wild, of this region, which are forced to succumb to its great strength."—(C. B. Kennerly.)

12. CANIS OCCIDENTALIS, var. RUFUS, Aud & Bachm (p. 113.)—Red Texan Wolf.

The red variety of the wolf is said to be very abundant in Texas.

13 CANIS LATRANS, Say (p. 113.)—Prairie Wolf: Coyote.

The question is not yet definitely settled whether the coyotes of Texas and California and the prairie wolves of the Upper Missouri are identical or diverse. The materials collected by the Commission are not sufficiently extensive to throw any decided light on the subject.

128. Eagle Pass, Texas. Sumner, 1852. A. Schott.

Known throughout the length and breadth of New Mexico, Texas, and Northern Mexico as the coyote. During the day it may occasionally be seen sneaking about, but always at a respectful distance; at night, however, there are no bounds to its impudence, not only coming into camp, but stealing your provisions literally from under your nose. It occurs in greatest numbers about settlements; a carcass, however, will not fail to attract a pack in the most barren and unforbidding regions. Camped on a woodless and waterless prairie, the traveller has to wait in some hidden spot near at hand but a few minutes after his companions have taken up the line of march, to have the cheer of living objects in the form of coyotes, creeping in to feed an ever craving appetite upon the offal, or its distant and discordant howl, yet wary of its safe approach. The coat in summer is thin and dirty; in winter, clean and thick. The variety of note and amount of noise a single one is able to produce exceeds belief; their serenades are most usually heard at dusk and in the morning; a fresh scent, however, is liable to excite a howl at any time after night, and no sooner is the key note struck up by a single individual than others chime in from all quarters. The discordant and variable chatter of the cayote has no resemblance whatever to the bark of a dog, and is at once distinguished from the deep, sonorous, melancholy howl of the lobo. The wolf, as a similitude for starvation and poverty, is, perhaps, unequalled, as is indicated by the character of its excrement; this shows that the animal is at some seasons, in some localities, forced to live upon the cactus fruit and grasshoppers, and other matter even more indigestible and more opposite than these, and which must be as little palatable to its natural taste as the thorns that encase its food are disagreeable to its lips

"Wolves have the bitterest of enemies in dogs; the sharp teeth and rapid snap of the former, however, require but a short time to rid them of the most furious attacks. On one occasion, while at the copper mines, three dogs attacked a single wolf, and, after an encounter of but a few minutes, one returned so lacerated as to cause its death within a week. Notwithstanding this enmity, traces of the wolf are unmistakable, and frequently seen among many of the dogs of Northern Chihuahua and Sonora. The inhabitants here make but two classes of the wolves, coyotes and lobos."—(J. H. Clark.)

"This animal, so common in Texas, is also found in great numbers west of the Rio Grande, extending even to the shores of the Pacific. Generally going in small bands, and frequenting, for the most part, the vicinity of the settlements, they are often a great annoyance on account of their depredations among the sheep and goats, which constitute the principal wealth of many of the inhabitants. And although generally preferring the night for their excursions in search of prey, and preferring to conceal themselves during the day in the grass, bushes, or rocky and solitary places, yet we have known them at El Paso del Norte to exhibit so much boldness as to come within the suburbs of the town, and prowl around among the houses in search of food, while it was yet light, rarely being disturbed by the dogs, with which they even seemed to live on quite familiar terms. Indeed, we have been assured by some of the inhabitants along the Rio Grande, that it is not at all uncommon for the coyote to cohabit with the domestic bitch; but notwithstanding we made great efforts to procure or even see the offspring resulting from this intercourse, we did not succeed in finding one where the proof was indubitable.

"During our march from the Rio Grande to Los Nogales, in Sonora, there was scarcely a night that these animals were not in the vicinity of our camp. Indeed, we have reason to believe that the same individuals often followed us for days from camp to camp, occupying each successive one as soon as left by us, and making a feast of the scattered fragments, and then hurrying on and trailing us to our next stopping place. During the day they were not very often seen, but at night their proximity was generally betrayed by their loud and peculiar bark. This bark is very different from that of the dog, and does not at all resemble the dismal howlings of the large species or Lobo. It is entirely unlike the noise made by any other animal of the prairies, and, when once heard, can never afterwards be mistaken. It is very sharp, quick, and varied, and two or three coyotes, joining in concert, make such a noise as might lead one who had never heard them before to suppose that there were thirty or forty animals present.

"The boldness which they exhibited about the camp when hungry was as surprising as it was often annoying. They sometimes robbed the cooks of what they had set aside for breakfast, even in covered pots or kettles; and should a piece of fresh meat be left hanging on some neighboring bush, it was almost sure to disappear before morning; and sometimes even harness or the equipage of riding animals might be dragged away or seriously injured by them, especially if it had been recently greased, and left carelessly in the night a little distance from the men.

"The coyote is not very swift, and can be readily overtaken on the open plain by a horse of ordinary fleetness; this is a plan sometimes adopted for their capture with the lasso, or shooting them with a pistol.

"I have never known it to attack the larger quadrupeds. It seems to depend mostly for subsistence in the desert regions, and those removed from the settlements, in hunting rabbits, rats, young birds, &c. I have never known it to attack a man, unless wounded, when it defends itself with fierceness and desperation."—(Dr. Kennerly.)

"*Prairie wolf of the Texans; coyoti of the Mexican; coyotl of the ancient Mexican; bay of the Apaches.*—There is no other quadruped forming so prominent a feature in the fauna of our western countries as the coyoti. Its importance in relation to man may be subordinate to that of the puma, jaguar, bear, or some of the ruminantia, but this deficiency is sufficiently counterbalanced by its numeric existence and some usefulness. This animal is called upon on one side to counteract an exuberant growth of organic life, both animal or vegetable, and also to clear the surface of dead matter, which otherwise would infect the atmosphere with unhealthy miasmata. What, too, the coyote may lack in size and muscular strength is sufficiently supplied by its activity, tenacity, and endurance.

"To almost every traveller the coyoti becomes first known by his howling about sunset or sunrise, in which several individuals usually join. This twilight call grows regularly into a piteous whimpering, and is almost invariably preceded by the short and sharp barking of one or two individuals, to which the others fall in instantly. It is, however, kept up only for a few minutes, after which the congregation seem to disperse, each individual following its sport by itself. In the morning about daybreak, often nearer to sunrise, a similar congregation takes place and ends in the same manner.

"To what purpose the coyotis hold their daily meetings can be but conjectured, and may not improperly be put on the same ground with similar gatherings of the crows or migrating birds before their journeys.

"Such gatherings of animals otherwise living and breeding in herds or flocks do not involve particular questions, but with the coyoti, which leads a solitary private life, and joins his kind only before scouting, it is different."—(A. Schott.)

14. VULPES VIRGINIANUS, Rich. (p. 138.)—Grey Fox.

The determination of this animal as an inhabitant of Texas rests on specimens collected on the lower Rio Grande by Mr. Schott. It is found all through the United States, from the Atlantic to the Pacific ocean.

For a full description of the skin and skull of this fox I would refer to the report on the mammals of the Pacific Railroad Survey.

201. Lower Rio Grande, Texas. Skin. Arthur Schott.—130. Eagle Pass? Skin. Arthur Schott.

"The grey fox, or *zorro* as it is called by the Mexicans, is not a very uncommon animal in Texas and New Mexico. In those regions it is generally found along the valleys of the streams where the tall coarse grass or bushes afford it a place of concealment, or in the rocky and solitary places on the hill side. In these spots it will frequently lie still while you may pass within a few yards of it, closely watching your movements, but as soon as it finds that it is discovered it makes a hasty retreat, passing rapidly through the grass or bushes, occasionally making a bound.

"I have never heard it utter any cry whatever, and am much inclined to doubt, as has been said by some, that it either builds its nest in the tops of the trees, among the branches, or even climbs them at all. (See translation of Berlandiere MSS., Art. *V. cinereo argenteus.*) I have seen this animal several times in or near groves of large trees on which the mistletoe grew in great abundance, but never saw in them a nest of any kind that would accommodate a fox, nor did I ever see the animal on a tree or take to one when frightened.

"Although this animal has been found on the Pacific coast in California and Oregon, yet in our route we did not observe it west of the Sierra Madre."—(C. B. Kennerly.)

"*Grey fox; zorro of the Mexican; Colishē of the Apaches.*—According to my observations this animal was more frequently met with in the valley of the Rio Bravo than anywhere else. In the list of the quadrupeds of Lower California a fox is also mentioned, but no description given. Whilst at Fort Yuma I learned from Major G. H. Thomas, then commanding officer there, that two apparently different species of the fox are known in that vicinity. The country forming the head of the California gulf differs so materially from any other in these latitudes that one or two different species of the genus may be expected there.

"The note of the grey fox, which we heard occasionally, resembles somewhat the bark of the coyoti, but is far less abrupt, so that it would be inappropriate to call it bark.

"Though this animal seems to be chiefly nocturnal, it is often met with sporting in broad daylight.

"The rocky clifty banks of the cretaceous formation, together with a more developed vegetation along the middle and lower Rio Bravo, seem especially to favor the haunts of this desert thief more than any other country.

"The natives consider the grey fox a much weaker animal than the common one, as he is easily run down. The specimen of our collection was surprised in a Mexican house at 'Pietras negras,' run down, and killed with a stick.

BASSARIS, Licht.

The species of the genus *Bassaris* look much like a cross between the fox and raccoon, having the cunning look and much of the form of the one, with the ringed tail of the other. The body is more slender than in the foxes, but stouter than in the common weasels; in fact, having much the proportions of the minks, *Putorius vison.* The hair is nearly as long as in the foxes, moderately soft and furry, with longer hairs interspersed. The ears are well developed and erect, pointed and naked on the outer side, but coated on the inner with short hairs. Their posterior edge is split, as in other carnivora. The head is sharp pointed; the naked muzzle quite large; the whiskers very bristly and long. The eyes are rather large. The tail is about as long as the body, quite bushy, though depressed and ringed alternately with black and white. The feet are all five-toed; their under surfaces hairy, except on the pads and balls of the toes, which are naked, and seem to possess a high degree of tactile sensibility. The claws are short and partially retractile.

The number of vertebrae in No. $\frac{1619}{4}$ is as follows: Cervical, 7; dorsal, 13; lumbar, 7; sacral, 3; caudal, 24, with one, perhaps two, lost at the end.

15. BASSARIS ASTUTA, Licht. (p. 147.)—Civet Cat.

Sp. Ch.—About the size of the house cat. Above brownish yellow, mixed with grey; beneath, whitish. Tail white, with seven or eight brownish black rings.

Size about that of the domestic cat, but rather more slender. Whiskers long, extending back further than the ears. Ears naked externally, except near the margins, where they are scantily haired.

The general color of the upper parts is a dull brownish yellow, with pale hairs interspersed. This tint is, however, much relieved throughout by long black hairs, sometimes imparting quite a dusky hue. The under parts generally are of a yellowish white, with, however, a brownish suffusion along the lower part of the flanks. The tips and edges of the ears, a spot above and below the eye and the upper lip are also yellowish white. The fur is all dull plumbeous at the base and paler at the tip, as described. Of the longer hairs interspersed, some are entirely black throughout, others black only at the tip, the basal portion being paler than the ground color, and producing the effect already referred to. The whiskers are black and white mixed. The basal inner surface of the ears is coated with dusky hair.

The tail may be described as dull white, with seven or eight rings of brownish black and a black tip. These rings are interrupted on the lower side for about one-fourth, so that the central portion of the under surface of the tail is white. The black and white hairs are of uniform tint to their bases, so that one color overlaps the other. These rings become wider and wider from the base to the tip, preserving, however, the same relative proportion of length throughout. Towards the base of the tail the black rings exhibit a considerable mixture of dull yellowish brown, caused by annuli of this color on the hairs near the tip.

A specimen of this species, collected by Captain Marcy, on Red river, in July, 1852, is much purer in its tints, the tail being clear black and white throughout, without any mixture of yellowish brown. The ground color of back and sides exhibits a considerable admixture of greyish ash, especially about the face and shoulders. The black hairs, too, seem concentrated along the middle of the back, forming quite a distinct longitudinal band from the nose to the tail.

Measurements.

	133.		4.			? 97.		
	Inches.	Lines.	Inches.	Lines.	100ths of length.	Inches.	Lines.	100ths of length.
Nose to root of tail	17	6	16	6	....	17	....	....
Tail from root to end of vertebrae	16	....	15	5	....	16	....	....
Tail from root to end of hairs	18	....	17	3	....	18	....	....
Ears, height above notch	1	5½	1	6	....	1	5	....
Ears, width	1	5	1	6	....	1	4	....
Arm, fore foot to end of claws	1	7	1	7	....	1	6	....
Leg, hind foot from heel to end of claws	2	7	....	....	....	....	....	....
Skull, length	....	....	3.20	....	100	3.26	....	100
Skull, width	2.02	....	1.88	....	.59	2.04	....	.63

In the spring of 1852 (April 23) a specimen of *Bassaris* was killed in a hen-roost, near Washington, after it had committed great devastation among the poultry of the neighborhood. It had evidently escaped from confinement, as shown by the marks of a collar around the neck. There was, of course, no indication whence it came originally, but it was supposed to have been brought from California. This specimen is somewhat different from those obtained in Mexico and Texas, although perhaps not specifically distinct. The tail is strikingly different in having the black rings fewer in number and of much greater extent compared with the white portion. Of these black rings there are only five distinctly marked ones besides the tip, and the last or sub-terminal one is more than two inches long instead of about one. Below, the black ring is nearly complete, separated only for the thickness of the vertebrae by the white of the under surface. There is no appreciable difference in the colors of the remaining portions of the body. The ears are decidedly smaller. Very considerable differences are discernible between the skull of this specimen and the others; the cranium is broader, but more constricted behind the orbital processes of the frontal bone; the distance between the zygomata is considerably greater, and the temporal crests of opposite side much closer together. The pterygoid bones, also, are further apart. The proportion of greatest breadth of skull to length is as 63 to 100 instead of 59, as in No. 4, from Texas. Should the examination of further specimens show these distinctions to be such as to indicate a different species, it might be called *Bassaris raptor*.

133. Eagle Pass, Texas. April, 1852. Major W. H. Emory, U. S. A. A. Schott.—4. ♀. Devil's river, Texas. Colonel J. D. Graham, U. S. A. J. H. Clark.

"This cat-squirrel, as it is called by the Texans, lives among rocks or trees; though not a rare animal, its quiet and nocturnal habits renders it inconspicuous, and the procurement of a specimen consequently an unfrequent occurrence. But a single one was seen, and that a female, in the crevice of a rock, with four or five young adhering to the paps. To detach these required considerable force; previous to that time they showed no signs of discomfort, although the mother had been dead several hours. It is said to be a constant and common occupant of Mexican out-houses and deserted ranchos. The specimen obtained, when first seen, was asleep; it fought furiously with claws and teeth in defence of self and home, and displayed no disposition whatever to run off. It is easily tamed and even domesticated, and makes a mild and playful pet."—(J. H. Clark.)

16. PUTORIUS FRENATUS, Aud. & Bach. (p. 173.)—Bridled Weasel.

200. Ringgold Barracks, Texas. J. H. Clark.—239. Matamoras, Mexico. Lieut. Couch.

17. MEPHITIS MESOLEUCA, Licht. (p. 192.)—White-backed Skunk.

This species is said to be quite abundant in western Texas. Its range to the eastward is not yet ascertained, although Berlandiere refers in his MSS. to this or an allied species as occurring at Matamoras.

18. MEPHITIS VARIANS, Gray (p. 193.)—Texas Skunk.

This species is easily distinguished among North American skunks by the great length of its tail, which considerably exceeds the body. The body appears slender, compared with the common *M. mephitica*. The feet are large, the fore claws much longer than the hinder ones (nearly twice.) The palms are entirely naked. The soles are hairy from the heel to the base of the metatarsals, (or for about one-third;) entirely naked elsewhere. The tail, including the hairs, is much longer than the head and body; its vertebrae about as long as the body without the head.

The hairs on the body are very long and bristly, though lustrous and rather soft. There is comparatively little under fur between the long hair. The hairs on the tail are very long, though shorter at the ends than on the sides.

The general color is a lustrous black; there is a narrow white streak on the top of the head from the snout to the occiput. On the nape, just back of the auditory opening, begins a broad patch of white, truncated anteriorly, and about an inch in diameter; this extends with sides nearly parallel to the shoulders, when it bifurcates and passes gradually round on the sides, and ceases above the thighs. Another narrower line, however, commences in continuation with those just mentioned on each side of the base of the tail, and extends for a considerable distance. The rest of the tail is black externally, but all the hairs are seen to be white for most of their length from the base; there is a white tuft on the middle of the tail, however.

Dimensions.

	No. 127.		No. 233.	
	Inches.	Lines.	Inches.	Lines.
Head and body	15	....	16	1
Tail to end of vertebrae	15	....	15½	....
Tail to end of hairs	18½	....	7	....
Longest hairs on sides	6½	....	....	....
Skull	$2\frac{10}{12}$	....	....	....

This species, in common with *M. mephitica*, belongs to the true *Mephitis*, as restricted by Lichtenstein, and characterized by the presence of four teeth in the upper jaw, behind the canines, instead of three. In both species, however, the soles are entirely naked for their terminal two-thirds. The skull differs from that of *mephitica* in the considerably larger size of the last upper and penultimate lower molar, while the penultimate upper molar is smaller than in *mephitica*. The ramus of the lower jaw has the condyle much more elevated, the distance to the summit of the coronoid process being little more than to the lower angle, while in *mephitica* it is considerably more. The much greater length and amplitude of the tail constitute strong points of difference, as well as the less amount of the basal fur.

The long tailed Texas skunk has, I think, been erroneously referred by Audubon and Bachman to the *M. macroura* of Lichtenstein. This species is characterized, in addition to its long tail, by a simple and continuous non-bifurcating broad dorsal white band, truncated anteriorly, beginning at the nape and extending over the upper part of the tail; thus somewhat like *M. mesoleuca*. There is also a white tuft in the end of the tail. There is, in addition to the dorsal band, a long supplemental white stripe on the side of the body. Lichtenstein expressly remarks on the constancy of the above markings in different skins, while all the Texas specimens I have seen agree with the description I have given, (including two very small kittens from Matamoras,) in lacking the white back and lower lateral stripe.

Mephitis vittata, of the same author, has three white stripes on the nape and one lateral on each flank, with a white tuft in the end of the tail.

The description of *M. varians*,[1] by Gray, is very unsatisfactory; but there can be little doubt that he had this species before him, especially as the locality given is Texas.

This species is abundant throughout Texas, but has not been observed in California. Its southern and northern limits have not been ascertained.

709. ♂. Monterey, Mexico. Lt. D. N. Couch.—237. ○. Matamoras, Mexico. Lt. D. N. Couch.—127. Mier, Texas. April, 1852. A. Schott.—233. Eagle Pass, Texas. Sept. 1, 1853. A. Schott.

19. MEPHITIS BICOLOR, Gray. (p. 197.)—Little Striped Skunk.

Several skulls of a small skunk were collected at Indianola by Mr. Clark, which I refer to this species. No skins were, however, obtained, which throws some uncertainty on the question.

20. TAXIDEA BERLANDIERI, Baird. (p. 205.)—Mexican Badger.

Sp. Ch.—Similar to the *T. labradoria*, but smaller; above reddish gray, with a narrow white stripe extending from the muzzle to the root of the tail.

The differences between skins of American badgers brought from Mexico and those found in the more northern regions of North America have long since been pointed out by Richardson and Bennett, although supposed to be due to local causes entirely, and not indicating different species. I have not had the opportunity of comparing skins from Mexico and the northern United States; but an examination of several skulls in the Berlandiere collection, together with his MSS. description and figures, clearly point out distinctive characteristics. The name assigned by Berlandiere would have been retained, had it not been a so-called barbarous one, and as such not to be perpetuated, if unpublished, however much the propriety of changing it, when properly brought before the scientific world, might be questioned.

Bennett, in referring to this species, says, that with the same general form and pattern the California "variety" has a much darker ground color, of a blackish brown, and grizzled with white on the hinder part of the head. The middle white line shows indistinctly in several places along the back; in fact, the most striking external distinction is seen in the extension of the line on the top of the head, over the whole length of the back to the root of the tail.

Judging from a comparison of skulls, this species is smaller than *T. labradoria*. The true molars are, however, decidedly larger; the outline of the posterior upper one is triangular, the antero-internal angle nearly right angled, its sides about equal. The penultimate molar, too, is broader, with its axis more nearly transverse. In *T. labradoria* the posterior molar is smaller, the antero-internal angle rather obtuse, and the penultimate molar not so oblique. From these there results a greater interval between these two teeth, which are in contact only externally, instead of being applied against each other for half their contiguous sides. The coronoid process of the lower jaw is less elevated in *T. berlandieri* than in *T. labradoria*, while the condyloid is even higher in proportion.

A younger but quite mature specimen from the Berlandiere collection, with the teeth perfectly unworn, although most resembling the others of the same collection, differs in having the true molars still larger. The last upper molar is shaped more like that of *T. labradoria*, but it has three lines of tubercles on the crown nearly parallel with each other. This tooth is of such dimensions that its longest (oblique) axis is equal to the distance between these molars themselves. The skull is narrower and shorter behind; the symphysis of the lower jaw shorter, &c. There is no mark to indicate whether this specimen came from Matamoras; from a widely remote locality there would be little hesitation on the part of any naturalist in making of it a distinct species.

---

[1] *M. varians.*—Tail elongate; black, with a narrow white streak on the forehead, a large square spot on the nape, and two narrow streaks between the blade bones. Tail black; base of the hairs white. Inhabits Texas.

21. PROCYON HERNANDEZII, Wagler. (p. 212.)—Black-footed Raccoon.

1386. Matamoras. Lt. Couch —1052. San Elizario, Texas. December, 1854. Dr. Kennerly.—1053. Devil's river. Dr. Kennerly,

"We found the raccoon quite common at various points on our road as far west as Janos, in the State of Chihuahua, but we did not observe it after leaving the country adjacent to that village.

"It prefers the vicinity of running streams where the bushes are thick, or where there are hollow trees in which it may make its bed. Although eminently nocturnal in its habits it sometimes comes out during the day in the desert places in search of food, especially when it has young. When pursued it takes immediately to the water, swimming with great rapidity and ease.

"We saw them often along the San Pedro river and other streams of Texas in November, along the Rio Grande in December, and very often along the Corralitas river in March and April. When there has offered no opportunity for its immediate escape into the water or impenetrable bushes, we have seen it throw itself back in a state of defence, showing its teeth in a threatening manner, but never heard it utter any cry.

"It is called *Tejon* by the Mexicans of the regions in which we have observed it, and its flesh is highly esteemed by them as an article of food."—(C. B. Kennerly.)

According to Dr. Berlandiere the habits of this species are precisely similar to those of the common raccoon.

Berlandiere speaks of the coati, "*Nasua fusca*," as common in the State of Tamaulipas, one in his possession having been caught in the "Sierra de Tamaulipas del Norte," where it is called apache, sometimes mapach.

22. PROCYON HERNANDEZII, var. MEXICANA, St. Hilaire (p. 215.)—Sonora Raccoon.

Procyon lotor, var. *mexicana*, St. Hilaire, Voyage de la Venus, Zoologie, 1, 1855, 25; pl. vi. (Mazatlan.)

A single skin was brought from Espia, Sonora, by the Boundary Commission, which agrees perfectly with the figure and description of St. Hilaire in the Voyage de la Venus, based upon a specimen collected at Mazatlan. These localities are quite in the same zoological province, although somewhat distant. The illustrious author of the mammalian portion of the report of the Venus is quite satisfied that the specimen examined by him differs in nothing from the true *P. lotor* except in the intensity of coloration.

The size of the animal is about that of the average of *P. lotor*. The fur is quite as long as *P. lotor*, and appreciably softer, in this respect differing somewhat from the description of St. Hilaire. The feet appear to be rather slender, and longer than in *P. lotor*. They are scantily haired and naked in patches on some of the phalanges. The tail is about half as long as the head and body, or perhaps longer; it is fully furred with long appressed hairs, and tapers gently from the base to the tip, which is somewhat truncate.

The colors of this animal are similar in pattern to those of the *P. lotor*, but the tints show considerable difference. The body is much lighter and more rusty yellow in its general impression. The long hairs are tipped with dark reddish brown, rather than with black, the reddish becoming rusty on the posterior half of the back and on the sides, the median annulus being a pale rusty white. The under fur generally is of a chestnut brown, tinged with plumbeous towards the base, the colors darkest along the back. The long hairs on the sides generally, as well as on the arm, are whitish to the tips. The feet are whitish above, the hinder ones showing a slight tinge of chestnut on their outer portion.

The tail is tipped with rich purplish chestnut, and exhibits six distinct annulations of the same, with faint traces of a seventh; of these the terminal four only are continued all round, the others being obsolete beneath. The intervals are rusty whitish, and a little larger only than the dark rings. The contrast between the two is not marked very strongly.

The head is marked as in *P. lotor*; the dark patch passing obliquely across the eye is of a dark brownish black; darker than any other portion of the body. It extends back to the line of the commissure, and is there separated from a lighter patch of the same under the chin by a light line prolonged backwards from the edges of the mouth. The sides of the muzzle anterior to the cheek patch and the end of the lower jaw, together with the ears, are dull whitish; the upper and posterior border of the cheek patch is of rather a purer white. The spot behind the ear is plumbeous chestnut brown.

Total length (skin) to root of tail	27, inches.	Fore foot from wrist	3.20 inches.
Tail to end of vertebrae	10 inches.	Hind foot from heel	4.30 inches.
Tail to end of hairs	12 inches.	Length of skull	4.30 inches.
Ear	2 inches.		

This animal, as already remarked, exhibits a close relationship to the common raccoon of the United States, *Procyon lotor*, although, in addition to the shade of coloration, it is readily distinguished from it by the larger and more naked feet and hands, longer, more tapering, and more narrowly annulated tail; the dark annuli being narrower and more distinct. It is in these characters that *P. hernandezii* differs also from *P. lotor*, and it is with *P. hernandezii*, accordingly, that the comparison must be made. There is, in fact, no very appreciable difference, except in shade of color. It is only necessary to replace the black tints on the body of *P. hernandezii* by a dark reddish brown, and the dark brown by a chestnut, in order to reproduce the colors of the Sonora specimen. The chestnut tinge replacing the brown of the hind feet is very slight and quite inconspicuous, except on close examination.

It may be mentioned that the stiffness and coarseness of hair in the Mazatlan specimen, together with the scantily haired condition of the feet, was probably owing to its occurrence within the Tierra Caliente of Mexico. The specimen from Espia, taken in the winter months at a greater altitude, and farther north, is naturally found to be clothed with a much softer and fuller fur.

In some respects this specimen approaches in external appearance the *Procyon cancrivorus* of South America. The latter is, however, much redder in its general colors, the tail longer, with more rings, the cheek patch smaller, being rather a dark border to the eye than a patch on the side of the head. The lower part of the legs is dark brown, and the toes more naked above.

A second specimen was seen by the party of the Boundary Commission, which agreed very well with it in general appearance.

The following table contains the measurements of the skull of this species as compared with those of *P. hernandezii* and *P. lotor.*

Skulls of *Procyon.*	*Procyon hernandezii.* No. 1837. Matamoras.		*Procyon lotor.* No. 898. New .		*Procyon hernandezii*, var. *mexicana.* No. $\frac{2098}{1051}$. Espia, Chihuahua.	
	Inches.	100ths of length.	Inches.	100ths of length.	Inches.	100ths of length.
Total length	4.80	1.00	4.50	1.00	4.40	1.00
From intermaxillaries to condyles	4.67	.97	4.33	.96	4.30	.97
Greatest width	3.17	.66	2.94	.55	....	....
Greatest height above base of occiput	1.50	.31	1.45	.32	1.50	.34
Distance between orbits	1.08	.22	.87	.19	.93	.21
Nasal bones, width before	.60	.12	.55	.12	.43	.09
Narrowest part of muzzle behind incisors	1.08	.22	.97	.21	.96	.21
Upper incisors from front to molars	1.20	.25	1.20	.26	1.13	.25
Upper incisors from front to hinder margin of palate	3.00	.62	2.76	.61	2.60	.59
Upper incisors, width between external edges	.70	.14	.63	.14	.60	.13
Upper molars, length taken together	.93	.19	.80	.17	.90	.20
Upper molars, least distance between	.87	.18	.70	.15	.66	.15
Between line of orbital processes to occiput	3.10	.64	2.87	.63	2.85	.64
Between line of orbital processes to end of nasals	1.60	.33	1.47	.32	1.43	.32
Between line of orbital processes to end of intermaxillary	2.40	.50	2.20	.48	2.20	.50
Orbit to end of intermaxillary	1.67	.34	1.50	.34	1.50	.34

1051. Espia, Sonora. April, 1855. Dr. Kennerly.

23. URSUS HORRIBILIS, var. HORRIAEUS, Baird.—Sonora Grizzly Bear.

Size less than the grizzly of the Pacific coast. Head very broad. Ears and tail nearly equal. Fore claws twice as long as hinder ones. General color dark brownish, with the tips of the hairs much lighter, (of a dirty amber yellow.) No distinct indication of dark stripes on the back and sides.

A single skin of this animal was collected by Dr. Kennerly, at Los Nogales, and brought home. Owing, however, to the excessive heat of the country, the skin appears to have been almost burnt, and contracted to such a degree as completely to obscure the proportions. In its present condition, it is less in size than the average of black bears, while originally the body was nearly as large round, and as long as that of a year old colt.

The prevailing characters of the animal are essentially those of the grizzly of the Pacific coast, in the large feet, elongated claws of the fore foot, &c. The ears are rather short, and completely concealed among the adjacent hair. The tail is very short, and entirely concealed; about as long as the ears.

The feet are very broad and large; the fore claws much larger than the hinder. The longest (removed from the skin) measures four inches along the convexity, half an inch of this, however, is implanted in the skin. The fingers are of nearly equal length, the first and fifth rather shortest, especially the former or thumb; the central claws are longest. The palm is naked, composed of a soft, highly papillose skin. There is a large central pad, rather broader than long, covering most of the foot; behind this, near the exterior edge, is a small circular pad, separated by a deep transverse crease, coated with hair; the naked balls of the fingers, also, are in nearly a straight line, and separated from the central pad by a transverse furrow, also well coated with hair. On the hind foot there is a single large naked pad, seven inches long, and between five and six inches wide, separated from the balls of the toes by a hairy transverse furrow. These balls diminish progressively from the exterior to the interior; the latter toe shorter than the rest. The longest claw measures about two and a quarter inches.

The hair is coarse in texture generally, and there is little under-fur. It is longest posteriorly and on the sides. The prevailing color of the exterior is a dull pale brownish yellow, with an amber tinge. The tips only are of this color; the basal and larger portion, with the intermediate wool, being of a dark chestnut brown, then passing into a pure blackish nearly to the yellowish tip. Immediately along the centre of the back the blackish tinge in the hair predominates decidedly, as it does (to less extent) posteriorly. The belly and inferior surface of head and throat are nearly of a clear brownish yellow. The legs are of a blackish brown, with a slight tinge of chestnut, the hairs very slightly tipped with yellowish.

There are some points in which this grizzly bear differs from specimens collected on the coast of California, but it will require the examination of a larger number to settle fully the question of permanent characteristics. The ears are shorter, and the tail longer than in the coast grizzly, the two being nearly equal instead of the ears being twice as long as the tail. The central large pad beneath the fore foot is longer in proportion to its width. The fur is decidedly softer, and the colors differently arranged. Thus there is not the conspicuous space along and behind the shoulders, with the hairs uniform yellowish to near the roots, as in the coast grizzly. On the contrary, the hair here is scarcely more largely tipped with yellowish than in the other parts of the body.

Skull. Two skulls of this species indicate very great age in the height of the sagittal and temporal ridges, the obliteration of all the sutures, and the much worn condition of the teeth. Compared with corresponding specimens of the California grizzly, the animals must have been nearly one-fourth less. The profile is much the same as in the California grizzly; in the oldest specimen (990) curving rapidly up from the occiput over the posterior third of the parietal bones, thus passing in a straight but slightly ascending line as far as over the posterior third of the frontal, then sloping rapidly downwards to the end of the nose, at first in almost a straight line, then gently concave. In one specimen the broad forehead is slightly concave transversely, in another it is straight; the orbital process in each being very convex externally. There is, however, no convexity in either specimen between these processes in either a longitudinal or transverse direction.

The point of greatest elevation of the profile curve marks the place where the sagittal crest bifurcates, and is continued on each side as a distinct temporal ridge, elevated above the plane of the forehead.

The under surface of the head is decidedly hollowed out, the lower profile exhibiting a considerable concavity, in this respect approaching the Polar bear. Thus a straight line tangent to the bottom of the notch between the occipital condyles and to the end of the intermaxillary will pass three-quarters of an inch above the palate.

A careful comparison of specimens of the grizzly bear, collected by the Commission, with a series from the Pacific coast, exhibits certain differences, which seem to be of importance. In the first place, as already remarked, the size of the animal is considerably less, probably by about one-fourth. The skull is also broader. Thus comparing No. 995 from the Coppermines, which is very young, but has all its permanent teeth, with 1220 from Monterey, in which all the teeth are in place, except the canines, which are about half way out, we find the former to be a very little longer, but with the zygomata .55 apart instead of .52. This difference lies in the size of the temporal fossae, the cranium proper being largest in 1220. The orbital processes are situated farther forward; the zygoma is longer, especially when measured on its free lower margin. The profile is much the same. The muzzle is narrower and more slender. Viewed laterally, the muzzle is seen to be lower than in the California grizzly, especially above the malar bone. The malar is much lower anteriorly, and the portion extending towards the anterior canthus is shorter and narrower. The distance from incisors to end of molars, as well as to end of palate, is half an inch less, though the animal is older, and the skull a little longer. The palate is more vaulted.

The lower jaw of No. 995 differs from the California specimen in being lower and having the coronoid process longer along its base. The distance from the back of the condyle to the first molar is about one-third the distance to the end of the incissors, instead of one-fourth, as in No. 1220.

The differences in the teeth of the two specimens are quite appreciable. As a general thing those of 995 are in every way much smaller in all dimensions than in the other, though considerably larger than in *U. americanus*. The three posterior upper molars measure 2.62 inches in the one, in the other 3 inches. The chief disproportion is in the posterior molar. This molar has the usual three tubercles or lobes along the inner edge and the two outer ones; instead of having the posterior half of the tooth behind the second outer and exterior to the second and third inner tubercles, stoping obliquely outwards and upwards, and with a general wrinkling of the enamel only, there is a third outer tubercle midway between the middle one and the posterior extremity of the tooth. The narrow space between this tubercle (which is not so high as those anterior to it) is occupied by a few enamel granules. The space between the two marginal series of tubercles is much less. The third upper molar from the end is broader. As in other species the crown of this tooth is divided longitudinally by a deep ravine, exterior to which is a series of two-pointed and trenchant tubercles, the posterior one of which exhibits a supplementary notch behind. The inner side of this ravine is occupied by a series of low tubercles, separated by furrows, both on the summit and inner side of the tooth; the central tubercle rather longest. In the other skull there is but a single trenchant or compressed tubercle, without any trace of subdivision.

The lower molars are very similar in the two specimens, except that they are smaller and narrower in No. 995. In both the posterior molar is triangular, the base anterior; in No. 995, however, the width is about three-fourths the length, and the whole tooth is considerably shorter than the second in advance of it, instead of being nearly equal, as in the Pacific specimen, where, also, the width of the tooth is little more than half the length.

The comparison of large skulls brought in by the Boundary Commission with corresponding ones from the California coast exhibits much the same differences as to the teeth; the bi-lobed or tri-lobed character of the inner half of the first large upper molar being maintained, as also the proportional inferiority in the size of the teeth, and the short longitudinal dimensions of the posterior molar above. The posterior root of the zygomatic arch, viewed from above, is narrower and more emarginated behind and before. The base of the head is much more arched longitudinally, in this respect approaching the Polar bear It has been already stated that a straight line tangent to the occiput and intermaxillary passes three-quarters of an inch from the bottom of the palate, instead of less than half an inch, as in the California bears.

As the result of the above comparisons, I have come to the conclusion that the grizzly bear of the southern Rocky mountains differs appreciably from the grizzly of the Pacific coast in smaller size, smaller teeth, rather broader head, and the other features adduced above, so that there is no difficulty in distinguishing them. Whether this is indicative of a different species or merely of a local race, I cannot say; an examination of corresponding specimens from the Upper Missouri, which I hope hereafter to make, will throw much light on the subject.

I have had no means of comparing the adult skulls of this bear with those of *U. arctos* of Europe. The latter species, however, as shown by a two year old skull, 1033, from Sweden, is considerably broader. The teeth are of much the same size, those of *arctos* rather larger. The last upper molar in the European bear has the posterior half more free from tubercles and more twisted, and the wrinkles on the crowns are finer and more numerous. The third molar from behind is much narrower in *U. arctos*, in this respect even exceeding the California grizzly; the inner lobe is single and much reduced in size. The posterior lower molars are of smaller shape and proportion.

This bear exceeds the *Ursus americanus* and *cinnamoneus* very much in size, and has other differences, which are readily appreciable. The arch of the head does not extend in a uniform convex curve, as in these species, and the forehead is plane and even concave; the anterior portion of the dorsal outline is usually convex in the small species. The proportional width of the head is less in the present species; the muzzle is longer. The zygomatic arch is more massive, especially the posterior portion, which is as high or higher than the anterior, instead of being considerably less. There is a much greater concavity of the posterior half of the palate than in *Ursus americanus*, where this is quite convex, and with various ridges not seen in the present species. The notch of the palate is distant from the posterior upper molar by the length of the latter tooth, while this distance is considerably greater in the smaller bears.

The most appreciable differences, however, next to the shape of the zygoma, size and proportion of the head, &c., are found in the teeth. These are proportionably very much larger than in *U. cinnamoneus*, and appreciably exceed those of *U. americanus*. The third upper molar from behind is, in particular, larger, broader, and with two or three lobes on the inner half, instead of a single and much smaller one. The crowns of the molars generally are more tuberculated, and less finely wrinkled than in *U. americanus*.

Skull.	990 ♂ Copper mines.		Skull.	990 ♂ Copper mines.	
	Inches.	100th of length.		Inches.	100th of length.
Total length	14.20	1.00	Upper incisors, width between external edges	1.87	.13
From end of intermaxillary to end of condyles	13.10	.92	Upper molars, length taken together	2.80	.19
Greatest width	8.20	.58	Upper molars, least distance between	1.80	.12
Greatest height above base of cranium	4.40	.30	From intermaxillary to commencement of orbit	5.70	.40
Distance between orbits	3.10	.21	Between post-orbital points of occiput	7.80	.54
Distance between orbital processes	4.70	.33	From post-orbital points to end of nasals	4.64	.32
Nasal bones, width before	1.40	.09	From post-orbital points to end of intermaxillary	7.40	.53
Narrowest part of muzzle behind canines	2.80	.19			
Upper incisors from front to molars	3.20	.22			
Upper incisors to hinder margin of palate	6.95	.48			

147. ♂. Los Nogales, Sonora, June, 1855. Dr. Kennerly.—990—995. ♂. Copper mines, N. Mex. J. H. Clark; skull.

"The black bear is the most common in southwestern Texas. A brown bear occurs here also, which I think can be hardly identical with the brown or grizzly of northern Chihuahua and Sonora. The brown bear of the former place is smaller, and is most usually met about water courses; these furnishing both cover and food, it is true there is but little inducement for it to wander out on the open prairie. The black or grizzly was found abundant in all the mountainous regions traversed west of Rio Grande. Late in the summer they leave the mountains for the open prairie, it is said by frontiersmen, for some plant which is relished much, and which ripens at this season. What that plant is I was never able to ascertain. As far as my observation extended, they make an annual migration from the rugged and unfrequented mountain, which they habitually inhabit late in summer, and probably because the supply of acorns, piñones, and cedar berries, their principal food, is exhausted at this season. Its habitat in the mountains is marked by upturned rocks, which seemed to be displaced for the sake of insects and other animals harboring under them, and loose soil torn up in pursuit of the roots of the cedar and other trees. Notwithstanding its awkward and ungainly gait, where the country is at all rough and broken, it will easily outdistance a mule. I have known this bear, when surprised and suddenly startled, to make a snuffling blow, or a respiratory grunt, which is, I believe, the only sound it is capable of producing. Once entering a grassy depression of prairie near the Cobre, I was surprised to see three of these bears sitting on their haunches at a short distance, to all appearances, calmly watching our approach; it was soon evident that they were only reconnoitering, for no sooner did they get the scent of us, than they put off at as rapid a rate as possible. As a rule, they avoid the vicinity of man; yet they have been known to come into camp after the offal after night, and even in day."—(J. H. Clark.)

"In regard to the bears that are found along the northern frontier of Mexico and the southern portion of New Mexico, there seems to be some confusion. In addition to the common black bear, *Ursus americanus*, and the large grizzly, *U. ferox*, there is found another animal, intermediate in size to these, generally of a brownish color, with the tips of the hairs often silvered, especially in the old individuals, and in appearance, except size, is almost identical with the *U. ferox* found in such great numbers in California. Among the people of the country they are known as *brown bears*; but this term is variously modified by the most experienced hunters, as we have heard applied by them, to the same individual, the names grizzly bear, touch of the grizzly, cross between grizzly and brown bear, and common brown bear; but on no occasion have we heard them assign any relationship between these animals and the common black bear, causing us to believe that there must be a considerable difference between this animal and the brown bear of Oregon, which is called by naturalists only a variety of the black; in fact, its size, generally, would necessarily preclude such comparison, while even the very old individual falls far short of the weight and dimensions of the *U. ferox* of California, of which we could much more easily consider it a variety than of the *U. americanus*.

"These animals were observed by us in greater or less numbers in the San Luis mountains, the Sierra Madre, and at Los Nogales; being particularly numerous at the first and last named localities. We were assured by the Mexicans of Sonora, who also distinguished this animal from the grizzly, that it was feared by themselves, as well as by the Indians, more than the latter, on account of its ferocity. This, however, admits of a considerable degree of doubt; for, notwithstanding some very good proofs of its boldness within our own knowledge, we also observed almost unexampled evidence of its cowardice. While, on one occasion, a very old male rushed unexpectedly from the bushes and made a fierce and unprovoked attack upon a gentleman of the Boundary Commission, who, probably, only saved his life by a fortunate escape into a neighboring tree, we observed, on a subsequent occasion, in the same vicinity, a female entirely forsake her cubs by a rapid retreat, and without being wounded; an this, too, notwithstanding the cries of the little ones while we pursued and captured them; she only looking around once, at a distance of half a mile, raising herself on her hind feet in a menacing manner, then again fled rapidly over the hills and disappeared. In the same region, a very large female grizzly defended her young with great desperation, and only fled after the cubs were entirely beyond the reach of the hunters, when she made her escape, covered with wounds.

"The food of these animals, in this country, consists of acorns, walnuts, piñones, (the fruit of the *Pinus edulis*,) manzanillas, the fruit of an ericaceous shrub, and such animals as they are able to capture."—(Dr. Kennerly.)

"*Grizzly bear; oso of the Mexicans; shaz of the Apaches.*—Near the highest crest of the Sierra Madre, called 'San Luis mountains,' I had an opportunity to witness a rare butchery, by which, in less than one hour, a whole family of grizzlies was killed, without one offering the slightest resistance. It was about noon on the 11th of October, 1855, when our long trains, coming from the Guadaloupe Pass, in the Sierra Madre, towards the San Luis springs, met on the plains these unexpected mountaineers. When surprised, they were lying on the ground not far from each other digging roots. The position in which they performed this work naturally caused long narrow strips of grassy lands to be turned up and searched as if it had been done by a bad plough. I could not learn what kind of roots they had been looking for. After taking off the thick skin of these root-diggers, we found them all in a very poor condition, and this may account for the want of that resistance which they failed to offer. The ungrizzly-like behavior of these poor brutes induced the majority of our party to doubt their being grizzlies at all. They evidently had descended from the surrounding mountains, where they have their stronghold in the rough trachytic recesses of this part of the Sierra Madre, the highest crest of which is densely crowned by a dark growth of pines. There their fruit stores had probably given out in the late season, and they were obliged to resort to roots to satisfy their hunger."

24. URSUS CINNAMONEUS, (p. 228,)?—Cinnamon Bear.

? Ursus americanus, var. *cinnamomum*, Aud. & Bach. N. A. Quad. III, 1853, 125; pl. cxxvii.

Sp. Ch.—Size equal to or less than that of the black bear. Color various shades of brown, very rarely black. Skull broader than in the common black bear.

Several skulls of a small bear collected by Mr. Clark at the Copper mines of the Gila appear to indicate a species quite different from the common black bear. The animals to which they belonged were all of a distinct brownish color, except one, in which the hair was "glossy black and pretty long." Although about the size of the common black bear, *Ursus americanus*, or a little smaller, yet four skulls of all ages before me, when compared with a corresponding series of seven of *Ursus americanus*, exhibit such characteristic differences as to authorize the conclusion that the species are distinct. Unfortunately none of the skins collected were brought home, owing to difficulty of transportation and other causes, and it is therefore impossible to speak more definitely of the external characters of this bear beyond the color, which was said to be of various shades of brown, with sometimes a reddish tint, sometimes darker, the tips lighter. In these characters it agrees with the cinnamon bear of authors, supposed generally to be a mere variety in color of the common American black bear. There is, however, an essential difference between the two; the cinnamon bear of Oregon being uniform in the color of its hairs from root to tip. Should further comparison show in the cinnamon bear of Oregon the same cranial and other essential characters as the *U. americanus*, differing from the one in question, I should propose the name of *Ursus amblyceps*, in allusion to the great comparative breadth of the head.

I am not aware that any direct comparison has ever been made between the skins and skulls of the black bears of the eastern United States and those of the Rocky mountains and the Pacific slope. It is quite possible that they may be really distinct, and that the western species occurs in the black and brownish varieties, which would substantiate the impression that these two colors in that country belong to one and the same species. There is at any rate no essential difference between the skull of the "black bear" of the Copper mines and the brown bears from the same localities, all exhibiting the same characteristic features as distinguished from the black bear of eastern America. The black variety, however, appears to be much the rarer of the two.

Skull. For reasons already explained I shall select a middle aged skull to serve as the type of my description, and afterwards point out the differences of the very young and very old specimens. Number 994, the head of a female from the Copper mines, has the tubercles of the molars and the crowns of the incisors considerably worn, so as materially to obscure their characteristics, while in a skull of *U. americanus* of the same age the molars are perfectly entire. The sagittal crest extends over a little more than the posterior third of the parietal bone.

The profile of the head exhibits a very decided convex curve from the occiput to the middle of the nasal bones, after which it passes off nearly horizontally, curving downwards towards the tip. The outline is, however, more convex than in *U. americanus*, rising higher in the middle. The central region of the forehead from the coronal suture to the middle of the nasals is nearly plain or slightly convex, rounding off gently on the sides and to the tip of the postorbital process of the frontal bone.

The outline from above exhibits a much greater breadth between the zygomatic arches than in the skull of black bear described (897), which is, moreover, a little older. Thus the greatest breadth is .617 of the total length, instead of .573. The projection of the end of intermaxillary beyond the end of molar is .316 of the total length; the least width between orbits is .227; the distance between the tips of the orbital processes is .34.

The lower jaw exhibits a decided character in the shape of its coronoid process. In this the upper end curves round into a decided hook, the posterior outline being very much emarginated.

Larger and older specimens exhibit a still greater breadth of head, amounting to as much as .629 hundredths, while still older heads of the black bear are but .597 hundredths.

This species, as already stated, differs very much in the width of the head from *Ursus americanus*; the width of the head being at all ages (except in the very young) more than six-tenths the total length in the one and less than this in the other. The upper edge of the zygomatic arch is a good deal more curved. The lower jaw exhibits a striking character in the great concavity of the hinder edge of the coronoid process, instead of the gentle curve of *U. americanus.*

There is quite an appreciable difference between the two species in reference to the anterior outline of the glenoid cavity. In one these outlines are in the same straight line, while in *U. americanus* they diverge anteriorly, so as to meet at an obtuse angle if produced backwards and inwards.

The molar teeth of *U. cinnamoneus* are much smaller than in *U. americanus.* Thus the three posterior upper molars in the largest specimen of *cinnamoneus* measure but 2.07 inches, the others less than two inches; in the smallest of *americanus* 2.22, in the largest 2.35.

In the description of this species I have not considered it necessary to make any comparisons with the other American bears, the grizzly and the polar, as these vastly surpass it in size. The *Ursus arctos* of Europe is also a much larger animal.

From a comparison of the teeth it is quite evident that the present species is less carnivorous than the *Ursus americanus* of the eastern States. Indeed, its food is said to consist in great part of the piñon or stone pine, and other seeds requiring a considerable amount of grinding before being swallowed.

Skull.	*Ursus cinnamoneus.* ♂. Gila. 991.		*U. cinnamoneus.* ♂ Gila. 992.		*U. americanus.* 988. ♀. Morehouse co., La.	
	Inches.	100ths of length.	Inches.	100ths of length.	Inches.	100ths of length.
Total length	11.50	1.00	11.10	1.00	10.30	1.00
From end of intermaxillaries to end of condyles	10.50	.92	10.60	.95	10.10	.97
Greatest width	6.90	.60	7.00	.63	6.00	.57
Greatest height above base of cranium	3.40	.29	3.20	.28	3.20	.31
Distance between orbits	2.55	.22	2.46	.22	2.30	.22
Distance between orbital processes	3.73	.33	3.63	.32	3.26	.31
Nasal bones, length	2.90	.25	2.90	.26	2.70	.26
Nasal bones, width before	1.14	.09	1.07	.09	1.03	.10
Narrowest part of muzzle behind canines	2.30	.20	2.28	.20	2.23	.20
Upper incisors from front to molars	2.80	.24	2.70	.24	2.30	.22
Upper incisors from front to hinder margin of palate	5.84	.50	5.60	.50	5.37	.52
Upper incisors, width between external edges	1.40	.12	1.45	.13	1.26	.12
Upper molars, length taken together	2.00	.17	2.07	.18	2.24	.21
Upper molars, least distance between	1.57	.13	1.63	.14	1.45	.13
From intermaxillary to end of nasals	4.90	.42	5.28	.47	4.47	.43
From intermaxillary to commencement of orbit	4.17	.36	4.38	.39	3.66	.35
Between post-orbital points to occiput	6.60	.57	6.20	.55	6.00	.58
Between post-orbital points to end of nasals	3.70	.32	3.67	.33	3.40	.33
Between post-orbital points to end of intermaxillary	5.80	.50	6.00	.54	5.10	.49

991. ♂. 992. ♂. 994. ♀. Skulls. Coppermines, N. M. J. H. Clark.

25. DIDELPHYS VIRGINIANA, Shaw, (p. 232.)—Possum.

The under-fur of this species is yellowish white, with dusky tips quite uniformly distributed over the body, most intense on the back. The legs are entirely dusky brown; the digits or fingers and toes yellowish white. The head is nearly pure yellowish white throughout, with only a dusky suffusion round the eye, and a dusky shade along the top of the head, widening and deepening into the brown of the back. The ears are black, with a yellow blotch on the upper edge; the tail is black on the basal fourth, the remainder yellowish white.

The long scattered hairs of the body are quite uniformly distributed and silvery white in color.

Length of head, 5 inches; of head and body, 20½; of tail, 14½.

I am not at present prepared to give the distribution of the common North American possum with any degree of precision. According to Audubon and Bachman its eastern limit is the Hudson river, while westwardly it extends to the Pacific ocean, and southwardly to Mexico. I am, however, inclined to doubt the extent of this range. No evidence is before me of its existence to any great distance west of the Missouri, the south Texas and California species being probably quite different.

This species is not found in southern Texas, but is said to occur in its northeastern portion. I have given its characteristics with the view of illustrating more fully the character of the *D. californica*.

DIDELPHYS CALIFORNICA, Bennett, (p. 233.)—Texas Possum.

This species appears to be considerably smaller than the common possum of the north. The tail is as long as the body, exclusive of the head and neck; the portion covered with hair is only about one-tenth its length.

The ears are large and naked on both sides, higher than wide, and rounded at the tips.

The under-fur is yellowish white throughout, except the terminal portion, which, on the back and sides, is dark brown; nearly black along the middle of the back. This color is more diffused on the sides and beneath. The legs and feet are entirely dusky throughout to the claws. The under part of the head, including the entire lower jaw, is dusky. There is a dusky patch in front of the eye, which commences a little behind the nostril and passes through the eye involving the eyelids, and, extending backwards and curving downwards about as far from the eye as this is from the nose, becomes confluent with the dusky of the chin. There is thus a distinct light patch on the side of the head from the nose, widening behind and terminating in a rounded outline, convex behind. The top of the head is quite dusky, with a faint indication of a dark streak along the central line, the whole confluent with the dusky of the tail. The ears are black, with a yellow blotch in the upper edge. The tail is white, except the basal third, which is black.

The back and side are thickly interspersed with long, yellowish, silvery hairs, thickest along the median line, much scattered on the sides; these measure from two to three inches.

A younger animal (199) is similar to the above in the general pattern of coloration, but is almost entirely black or dark brown throughout, except the light patch on the cheek and one behind the ear. The long, soft hairs are wanting entirely, but the remaining fur is much coarser than in the specimen first described, the hairs black or dark brown, the basal half whitest. There are softer, shorter hairs interspersed, which are black only at the extreme tip.

No. 1058, from the Valley of Mexico, is similar to 138, but rather lighter. The basal half of the tail and the entire ears are black.

This species may be very readily distinguished from the *D. virginiana* by several characters. In the latter species the fingers and toes are white; there is more white on the ear. The head is greyish white, with only a dusky blotch immediately around the eye; but no such pattern of marking as described. The size of *D. virginiana* is considerably larger; its ears more rounded or less pointed above; the hairy portion of the tail longer.

The only other species with which a comparison is required is the *D. azarae*. In this the body is as dark or darker than in the present species; the head and neck are, however, white, with a single central dark stripe along the forehead to the dusky of the nape. The ears and toes are flesh colored. *D. aurita* is similar in some respects, but wants the well defined white cheeks, and has flesh colored toes. *D. cancrivora*, though of dark pelage, has no well defined markings on the head ; the long scattered hairs, too, are blackest.

This animal agrees pretty well with the *Didelphys californica* of Bennett, which, however, I cannot distinguish from the *D. breviceps*, except by the length of the tail, which, as given by Bennett, measures 16 inches, with a body of 12. Waterhouse, however, in redescribing the same specimens, gives the head and body at 17 inches ; the tail, 14; which is much nearer the proportions of the specimens here described.

The *D. pruinosa*,[1] of Wagner, appears to be the same animal. The *D. californica*, of Burmeister, in Fauna Brasiliens, is described as having the ground color reddish brown.

Although there are some differences in the skulls of the *Didelphys virginiana* and those of the subject of the present article, yet I am not able to establish on them any specific characteristics. In fact, the variations in the thickness and length of the muzzle in different species, in addition to other points, are so great as to readily convey the impression, without a knowledge of the facts, of many more species than really exist. This will be more intelligible from the following measurements :

Measurements of skulls.

	DIDELPHYS VIRGINIANA.								D. CALIFORNICA.			
	2452, Georgia.		2200, Georgia.		680, Carlisle.		527, Carlisle.		1401, Matamoras.		1121, Texas.	
	Inches.	*100ths.*	*Inches.*	*100ths.*	*Inches.*	*100ths.*	*Inches.*	*100ths.*	*Inches.*	*100ths.*	*Inches.*	*100ths.*
Length of skull........................	5.06	100	4.80	100	4.86	100	3.65	100	4.40	100	3.50	100
Width between zygomata	2.65	52	2.50	52	2.90	60	1.98	54	2.60	59	1.75	50
Distance to orbits.....................	2.19	43	2.10	44	2.18	45	1.61	44	2.05	46	1.55	44
Width of muzzle, behind canine........	.98	19	.80	17	1.02	21	.67	18	.96	22	.68	19

Measurements of skins.

Current No.	Locality.	From tip of nose to—				Tail to end of vertebræ.	Length of—		Height of ear above notch.	Nature of specimen.
		Eye.	Ear.	Occip.	Tail.		Fore foot.	Hind foot.		
138	Matamoras	....	....	3.80	16.50	11.25	1.50	2.20	1.40	Dry skin..........
199	Lower Rio Grande.....	....	....	....	13.00	8.54	1.50	2.10	1.30	....do.............
1058	City of Mexico	1.52	3.30	3.60	15.50	12.25	1.65	2.20	1.20	....do.............

1058. City of Mexico. John Potts.—199. Mouth of Rio Grande. J. H. Clark.—1197. Guyapuco, Mexico. Lt. D. N. Couch, U. S. A.—138. Matamoras, Mexico. February, 1853. Lt. D. N. Couch, U. S. A. (26.) Skin.

The range of this species, as shown from the list of specimens, is from Texas to the city of Mexico ; how much further cannot now be determined. It probably extends into Upper California, though I have never yet seen any specimens from our Pacific Territory.

"Found on the lower Rio Grande ; is not probably an inhabitant of the central part of the continent, as the Mexicans who had come down from Chihuahua had never seen such an animal. Its favorite food is the black persimmon, an abundant fruit of this region."—(J. H. Clark.)

---

[1] This is quoted by Waterhouse, Burmeister, and others, as described in Wiegmann's Archiv for 1842. The first mention of it by Wagner, however, appears to be in the Suppl. Schreber III, 1843.

ORDER

RODENTIA.

27. SCIURUS LIMITIS, Baird (p. 256.)—Texas Fox Squirrel.

This species is intermediate in size between *S. migratorius* and *carolinensis*, and is quite well characterized by the sparseness of hair everywhere and its compactness; features which we should expect to find in a squirrel from the warmer portions of Texas. There are but four upper molars on each side, all large. The head is broad and rather short; the septum of the nose naked. The ears appear to be unusually high, and coated equally on both sides with very short hairs, without any bushiness or tufts even at the base. The feet are less in their proportions than many other species. The claws, however, are well developed; the fourth finger is longest, the third shorter, the second reaching to the base of the claw of the third and shorter than the fifth, the first or thumb rudimentary, as usual; palms naked. On the hind feet the second, third, and fourth toes are nearly equal; the claw of the fifth reaching a little beyond the base of the claw of the fourth, the first in turn bearing the same relation to the fifth. The sole is naked from the tarsus, (or on the under side of the metatarsus,) a few short hairs only being seen near the outer edge. The inferior surface of the toes is also naked, and without any fringe projecting from the sides. Both palms and soles are dark brown.

As the tip of the tail is broken off, the exact proportions cannot be ascertained; the hairs, however, are rather short and sparse, more scanty than in any other species examined.

As already stated, the hairs everywhere are short; the longest on the back do not measure half an inch, while the average is not more than four lines. The upper parts are a mixed cinnamon and black; the individual hairs being light plumbeous at the base, then cinnamon, then black and tipped with cinnamon brown. The sides of the head, both surfaces of ears, whole under parts, and all the limbs (except the external upper portion) are of a light cinnamon brown, (not rufous,) the hairs being a little lighter towards their bases; the upper surfaces of the feet are tinged with rusty. The hairs on the under surface of the tail are uniform, and of a color a little deeper than that of the belly; those above are like the back, (the color, however, being more yellowish,) with three annulations of black; on the sides they are similarly annulated, with the sub-terminal black more extensive. There is no decided preponderance of color on the upper part and sides of the tail.

A single specimen of this species was obtained by Mr. Clark on Devil's river, or the San Pedro of the Rio Grande, Texas.

Length to base of tail, 10 inches; tail, (multilated,) —; ears above the skull, .60; ears on posterior edge, .75; fore feet from wrist, 1.08; hind feet from heel, 1.67; longest hairs of tail, 2.17; length of skull, 2.25; width of skull between zygomata, 1.30.

Notwithstanding the marked difference in color and size between this species and all the other American fox squirrels, I am far from feeling sure now that it is anything more than a local variety of the common western fox squirrel. Had I deferred characterising the species until the present day, I should hardly have ventured upon a new name without a more ample knowledge of the North American squirrels than I possessed two years ago. I only retain it now provisionally, until its real character can be better tested by additional specimens. The locality is considerably further west than that of any other specimens which have fallen under my notice.

351. Devil's river, Texas. J. H. Clark. J. H. Clark.—1515. Devil's river, Texas. Dr. Kennerly.

"Of this species but a single specimen was seen, and that on Devil's river, in the midst of thick vegetation. It had here built a bed of leaves and twigs, into which it ran on being pursued. After it was forced out of this retreat, and wounded, it took to the ground and attempted to hide in the weeds and grass. This squirrel is said to be quite abundant in eastern Texas, along the margins of rivers where the vegetation is most luxuriant. Its fondness for dense vegetation doubtless explains its ab ence further west. Neither the bark of this nor the preceding species was heard."—(J. H. Clark)

28. SCIURUS LUDOVICIANUS, Custis. (p. 251.)—Western Fox Squirrel.

Undoubted specimens of this species have been found in eastern Texas.

29. SCIURUS CAROLINENSIS, ? ?. (p. 263.)—Mexican Grey Squirrel.

In the collection of Lieutenant Couch are two grey squirrels from Santa Catarina, New Leon, which differ from the common grey squirrel of the United States in some quite appreciable points. They are smaller, with longer tail, and shorter and broader feet. The hair is coarser, above more decidedly grey and black, beneath very pure white, without any indication of the rusty line on the side of the belly, seldom if ever wanting in the more northern grey squirrels.

The skull differs from that of the common grey squirrel in lacking the small anterior upper molar, leaving but four, as in the fox squirrel. The zygoma extends further backwards, the muzzle shorter and broader. The nasal bones have their edges nearly parallel for the posterior third, instead of approaching each other gently behind.

Some skulls from San Antonio, Texas, (without skins,) agree in character with the above; one out of three has the small anterior molar.

30. SCIURUS CASTANONOTUS, Baird (p. 206.)—Chestnut-backed Squirrel.

This large and stoutly built squirrel belongs to the section with five permanent molars in the upper jaw. Of two skulls before me, one, No. 1108, shows the two anterior permanent molars just appearing, the temporary ones having been shed; the three posterior have their crowns perfectly unworn. There is also a very small rudimentary fifth anterior molar in the lower jaw, which may, however, be the remnant of the deciduous premolar. In another, No. 1107, the five permanent molars are all in place, with the crowns somewhat worn; the entire fifth molar of the lower jaw has disappeared. These skulls exhibit a somehwat greater prominence than usual of the anterior portion.

The whiskers are black and longer than the head. The ears are high and not at all tufted, although the hairs are moderately long on the anterior inflected portion. The feet are moderate; the third and fourth fingers equal and longest; the second and fifth about equal; their claws reaching the claws of the others; the thumb or first, as usual, is rudimentary. The fourth, third, and second toes are successively a little shorter, but longest of all; the fifth reaches to the claw of the fourth, and the first to that of the fifth; the soles are naked from the tarsus, (or on the under surface of the metatarsus,) although the hairs encroach somewhat on the outer edge.

The tail is a little longer than the body. It is not bushy, but rather slender, and the hairs are not full, as in most of the other large species.

The general tint of the upper parts and sides of the body and limbs is a mixed lead color and ash grey, with some scattered black hairs. The whole back from the nape to the base of the tail is of a deep and well-defined chestnut brown; this color being not a mere dorsal stripe, but covering a space the width of the tail. The sides of the head and the ears are grizzled ash. The under parts, the eyelids, and the upper surfaces of the feet are of a rather clear white, the latter somewhat grizzled. The colors of the sides and belly are separated by a dusky line, as in the chickarees. There are some scattered chestnut hairs in the sides. The tail is entirely white and black; the central portion black above, white beneath, with white margin and tip; but all the black hairs are tipped with white. The hairs of the tail beneath are uniform white; on the sides they are mostly white, mixed with a few black ones; on the upper portion they are black at the base, then white, then black and tipped with white, the black predominating. In one specimen, however, the supra-caudal hairs are glossy black, except at their tips, which is the case in both with the hairs at the end of the tail.

Two specimens, male and female, of this species were collected by Mr. Clark at the Copper mines of the Gila, in the spring season. They were found among the pines.

Length to root of tail, 12; tail to end of vertebrae, 11; tail to end of hairs, 12.75; greatest width of tail, hairs extended, 4 50; hind feet from heel, 2.60; hind feet, naked part of soles, 2.08; height of ear above skull, .84; height of ear behind, 1.33; length of skull, 2.40; breadth across zygomata, 1.33.

This species bears a very close resemblance to *S. aberti*, and may prove to be the same, although there are apparent differences. The most striking characteristic is the absence of the beautiful ear tufts of *S. aberti*. Some of our squirrels which have smooth ears in summer are tufted in winter, but as the Copper mine specimens were caught in spring, it is not likely that they are ever tufted. The tufts, too, of *S. aberti* are long hairs growing from the very margins of the ears and project an inch beyond. The interior surface of the ear and a wooly space at their posterior bases are greyish white in *S. castanonotus*. Great differences again are visible in the tail, which in the latter is nearly pure black and white; the inferior hairs pure white, those on the upper surface and upper part of the sides are black, with white tips, greyish at the base. In *S. aberti* all the hairs above are annulated several times with dark brown and greyish white, presenting no decided impression of either color, except towards the end of the tail. The tail here is likewise much more bushy.

S. fossor is without the dorsal stripe and the dark lateral line. The tail is much fuller and more bushy; the hairs beneath the tail are finely annulated ash grey and black, without any of them being entirely white. The feet also are dark colored.

The skull of this species is of very nearly the same size with that of *S. carolinensis*, from Carlisle. Like this species it has an anterior small upper molar, making five, but this is considerably larger in the New Mexican animal, and has a central tubercle on the crown, with a lateral valley on either side, as in the spermophile. There are no other differences of importance.

The name of *castanotus*, as originally published, was a typographical error, not detected until too late, and conveys an erroneous impression in regard to the color of the ears.

121. 122. Copper mines of the Mimbres, N. M. Winter? 1857. J. H. Clark.

"This squirrel was observed in greatest abundance among the tall pines growing on the mountains about the Copper mines. Though the piñon (the fruit of this pine) at seasons constitutes its principal and almost only food, it frequents the ground; on being alarmed it seeks the largest trees, and hides itself in the topmost branches, without ever showing any disposition to leap from tree to tree. That it always sought safety in the nearest large tree when surprised led me to believe that it does not resort habitually to 'hollows," but lives and rears its young in 'nests.' Although occuring in greatest numbers in pine regions, it was occasionally met with among the oak-covered mountains about Santa Cruz."—(J. H. Clark)

31. TAMIAS DORSALIS, Baird (p. 300.)—Gila Striped Squirrel.

Head acutely pointed; body elongated; feet and limbs moderately developed. Thumb rudimentary, with a nail; third and fourth toes and claws equal; second a little shorter than the fifth or exterior, the claw of which reaches to the base of that of the third. Palms naked. On the hind feet the inner toe is shortest; the second, third, and fourth successively longer; the fifth claw reaches a little beyond the base of the fourth. Sole naked or with a few scattered hairs; heel hairy. Claws all well developed, and clothed with bristles at the base. Tail quite short, little more than half the length of body.

This species has the lines on the sides of the face, as in other species of *Tamias*, but they are better defined than usual. Thus there is a distinct line nearly white from the snout over the eye, but not extending to the ear. A branch passes under the eye, and, extending beneath and along the base of the ear, is lost in a hoary patch behind it. A dark reddish brown stripe, mixed with black, separates the upper stripe from the crown, and another similar to it divides the lower stripe throughout its length from the dirty white of the throat and neck. A third line of the same passes back from the eye to the base of the ear, and runs up on the anterior inflected portion, where, however, it is nearly pure reddish brown.

The ears, as stated, are reddish brown on the anterior third; another third is greyish brown; the rest or posterior portion is dirty greyish white, continuous with a patch of the same behind the ear, and extending backwards for half an inch. The concavity of the ear is well covered with short hairs; brownish anteriorly, ferruginous on the posterior half.

The especial characteristic of this species is seen in the single well defined dorsal stripe of dark brown, extending from the back of the head where it distinctly separates the hoary patches already mentioned, and extends to the base of the tail. On either flank is visible a faint line of light greyish, occupying the position of the exterior light line of other species of *Tamias*. There are also the faintest possible traces of the other dark and light lines, making up the five dark and four light stripes of *Tamias*. The top of the head and upper parts generally have in general a hoary or greyish aspect, mixed with light reddish and brown; the former predominating in one specimen, the latter in another. The under parts are dull greyish white; the sides of the body, the buttocks and the exterior surfaces of the hind feet pale rusty, lighter on the fore feet.

The tail is more bushy than usual. On the upper surface the hairs are glossy black at the base, then chestnut, then black, and finally dull white; the first two colors of equal extent, about half that of the two latter. Beneath the hairs are chestnut at the base.

Two specimens of this distinctly marked species were procured at Fort Webster, Copper mines (where it is rare), in the winter of 1851.

Measurements.—Total length, 5 inches; tail vertebrae, 2; tail to tip, 3.50; hairs of tail at tip, 1.50; hairs on sides, 1.25; hind foot from heel, 1.25.

This species is readily distinguished from all others by the single dorsal stripe, the others being obsolete. The more bushy tail, with its conspicuous markings of chestnut black and white, is also highly characteristic of it.

119, 120. Fort Webster, Copper mines of the Mimbres, N. M. Winter? 1857. J. H. Clark. Skin.

"This was found only about the cañons in the Copper mine region. It is secluded in its habits, and never wanders far from its abode, which seemed to be principally in the crevices of rocks. Once one was run into a hollow cedar; but this only proved to be a temporary or rural habitation, for, on the first jar of the tree, it ran out and made for the rocks. Aware of its presence in a certain cañon during my stay at the Copper mines, its shyness and seclusion for a long time baffled my utmost efforts to secure a specimen. I finally adopted the plan of 'lying in wait,' which proved successful in this, as in many other cases. After watching for some hours there was a shower of rain, when some three or four cautiously emerged from a crevice dripping wet; rain, being an unusual thing, probably took them by surprise. While combing their hair with their paws and licking themselves dry, one shot secured three. Piñons, cedar berries, and acorns are its food."—(J. H Clark.)

32. SPERMOPHILUS GRAMMURUS, Bach. (p. 310.)—Line-tailed Squirrel.

125, 126. Copper mines, N. M. J. H. Clark.—? 1046. Los Nogales, Sonora. June, 1855. Dr. Kennerly.

"This very squirrel-like spermophile was observed in great numbers in the neighborhood of the Copper mines. Thence westward it inhabits the mountainous regions; its occurrence east of the Rio Grande is doubtful. Its home is between and under the strata of rock; it sometimes, however, apparently burrows directly into the side of the mountain, and to a great depth, judging from the amount of dirt brought out. On examination these holes were found to lead along the face of the rocks, probably because the soil is here looser and more easily moved.

"Several sometimes inhabit the same locality, but it is more frequently seen alone. At the Copper mines, where I had a good opportunity of studying the habits and manners of this and other animals, it seemed to select its retreat with reference to food, acorns and walnuts, for which it climbs the trees, and with great facility, but always hastily leaves them when alarmed, and hies away to near its hole, where it stops to reconnoitre. If its suspicions are well founded, it dodges in, but usually comes out again in a few minutes and returns to its labor or amusement above ground. Early in the morning or late in the evening, may most always be seen about its den, feeding or playing; about mid-day, as if following the example set by the 'lords of creation' that dwell here, it retires for a siesta. The pouches of the specimens obtained were filled with acorns in process of transportation for winter store. Occasionally one may be heard, while sitting at the entrance of his house, uttering a short, sharp note. I could never make out whether this bark was the wail of distress or the call of companionship; it always proceeded from an isolated and lonely individual."—(J. H. Clark.)

"We first observed this species (No. 1046) in the Santa Cruz mountains, and afterwards found it very common in the vicinity of Los Nogales. It seemed to make its nest indifferently in the rocks or in hollow trees, when there was an entrance about the root, but we have very seldom seen it climb the trees. In its movements on the ground it very closely resembled the common grey squirrel (*Sciurus carolinensis*), perhaps not so swift and active. It walked leisurely from point to point while searching for food, and rarely leaped and jumped like the latter, though it often paused, raised itself on its hind legs, and seemed to listen and reconnoitre. It was quite shy, and was never found far from its den, to which it rapidly fled upon the slightest appearance of danger.

"Its food consisted principally of acorns, of which there were generally an abundance in the regions where it was found."—(Dr. Kennerly.)

33. SPERMOPHILUS COUCHII, Baird (p. 311.)—Black Ground Squirrel.

338. Santa Caterina, N. Leon. April, 1853. Lt. Couch.

34. SPERMOPHILUS TERETICAUDA, Baird (p. 316.)—Round-tailed Spermophile.

1584. ♂. Fort Yuma, Cal. Maj. G. H. Thomas, U. S. A. Skin.

35. SPERMOPHILUS MEXICANUS, Wagner. (p. 319.)—Mexican Ground Squirrel.

This well kown spermophile is found probably throughout Mexico, although the Rio Grande appears to be about its northern limit. It is found as far west as the Pecos, and even at El Paso, where, however, it begins to be replaced by *S. spilosoma*, which in turn extends to the Gulf of California.

518. Pesquièra Grande, Mex. May, 1853. Lt. D. N. Couch, U. S. A. 203.—2498. Matamoras, Mex. May, 1853. Lt. D. N. Couch, U. S. A.—352. Brownsville, Tex. Feb., 1853. Lt. D. N. Couch, U. S. A.—140. Eagle Pass, Tex. 1852. A. Schott.

"This species was found in greatest numbers in the valley of the lower Rio Grande. It lives in the ground, and its burrow is always made with reference to the protection afforded by a thorny brush or cacti against the attacks of the coyote and other enemies. If the entrance happens to be in an exposed place, it is sometimes fortified by thorny pieces of the mesquite and cacti. Though somewhat companionable, each, as a rule, seems to have its own house. Like other mammals, it is most above ground in the morning and evening in search of food ; yet it is apparently the least affected by the heat of the midday sun. It is omnivorous. Its bed is a globular mass, lined with soft material, and has but one entrance."—(J. H. Clark.)

36. SPERMOPHILUS SPILOSOMA, Bennett (p. 321.)—Sonora Ground Squirrel.

This species was first described by Bennett from a specimen obtained in western Mexico. It occurs abundantly from the Gulf of California as far east as El Paso, and even northward to Fort Stanton.

290. Chihuahua city. 1853. John Potts.—1042. Janos, Sonora. April, 1855. Dr. Kennerly.—141. ♀. El Paso. 1852. J. H. Clark.

"This species was quite common on the prairies around Janos. It lived sometimes among the rocks, but more often had its bed in piles of dirt heaped around the base of some bush. These piles were elevated several feet above the surrounding ground, and were entered by three, four, or more apertures near its summit. They were exceedingly shy, and a specimen was procured with difficulty."—(Dr. Kennerly.)

37. CYNOMYS LUDÓVICIANUS, Baird (p. 331.)—Prairie Dog.

The well known prairie dog is an inhabitant of the central portions of the United States, from the Upper Missouri region to the Rio Grande. It has not yet been found west of the Rocky mountains, unless a young animal, possibly of this species, collected by Dr. Kennerly between Janos and San Luis Spring, may be considered as indicating this fact.

1054. Devil's river, Tex. Dr. C. B. Kennerly.—1035. ○. San Luis Spring. April, 1855. J. H. Clark.—161. Limpio Mts. J. H. Clark.—498. San Antonio to El Paso. J. H. Clark.

"This animal is well known under the name of 'prairie dog,' and as almost the only inhabitant of the high dry prairie land, destitute of every form of vegetation except grass. The pursley (*Portulacca*) is a favorite food ; in the most populous parts of their towns, after having eaten up the grass to the very roots, they migrate to a more verdant spot. In extensive towns of old standing there is sometimes scarcely a sprig of grass to be seen for miles. They prefer the depressions or hollows in the prairies, partly because of the greater amount of vegetation in such places, but also because of the reservoirs of water that are probably collected here. When the water has wholly evaporated, or sunk below their reach, as sometimes must be the case, the succulent roots supply its place. Whether the result of instinct or a rational deduction, their habit certainly comes under the motto of 'early to bed and early to rise ;" for little is seen or heard of them after sunset ; and before sunrise they are seen in great numbers and all sizes, feeding, chasing each other, or sitting on their haunches ; they frequently assume this latter position when approached. As the sun heightens and it becomes hot they disappear in their burrows, till, in the heat of the day, there is scarcely one to be seen. When it rains they come out in great numbers, pile dirt around the entrance to their holes, which are sometimes completely covered over, presenting the appearance of a dutch oven in minature. In closing up their burrows, they mix grass with the mud and work from the inside after it is nearly completed. There is no doubt that this is done with the object of securing themselves against the water that may collect or run through the depressions in the prairie which they inhabit. I once witnessed, near Presidio del Norte, the 'drowning out' of a small town by a sudden and heavy shower; some swam to the high ground, many were drowned, and not a few fell a prey to the coyote. Several were taken alive and kept a month; they were fed on pursely, of which they ate voraciously; they also drank water freely. Most of the time, however, they lay on their bellies in a sort of stupor, with their nose and feet drawn together. A prairie dog is always fat; and, under some circumstances, may be considered good eating; which, being deposited in a comparative great quantity between the skin and muscle, renders the skinning a tedious operation. Their burrows, at first either nearly perpendicular or slightly inclined for a few feet, lead off in various directions; their extent I was never able to ascertain. Half a dozen or more will at times run into the same burrow; yet they will pass, even when hotly pursued, very eligible habitations externally, showing, though eminently social, that each has his own house. In all discussions of the prairie dog it has been universally associated with the owl and the rattlesnake, and for no very good reason that I see. The rattlesnake is found in other localities just as abundant as in dog towns; and if one is seen in or about a burrow, a close examination is very apt to disclose a spider's web across the entrance, indicating that the rightful occupant has been frightened off or devoured. The owl is undoubtedly an interloper, using its neighbor's house as a convenience, and possibly feeding upon its young; its proximity, however, gives the dog no uneasiness, and both inhabit the same burrow at the same time."—(J. H. Clark.)

"This interesting little animal, about which so much has already been written, and its habits so closely studied and accurately described by many naturalists, never fails to attract the attention of every traveller on the western prairies; and an approach to one of their settlements, after long and dreary marches, is always hailed with delight as a pleasant change from the monotony of lifeless scenes to one of cheerful activity and motion. Such occasions never fail to excite a certain degree of pleasure in every one, as he watches the motions of these curious creatures as they at first assemble in numbers as if in grave consultation in regard to the intrusion of strangers upon their quiet domain, and, upon the too near approach of apparent danger, suddenly the assembly is dispersed, each one retiring to his respective home, and, standing upon the edge of his den, utters his peculiar bark, as if in defiance; and then every one disappears suddenly, and every voice is hushed when a single gun is discharged.

"These settlements or 'dog towns,' as they are called, are of frequent occurrence between Devil's river, of Texas, and the Rio Grande, some of them covering many miles of country. West of the latter stream we observed them as far as the Sierra Madre. We visited the San Luis valley in the month of May, where there was a very large extent of country covered with their burrows. Here we procured a young one, which was probably a week or two old. We were attracted to it by a low whining noise which it made, not unlike that of a very young kitten. It was found on the surface, and was so young and feeble that it did not attempt to escape when approached. Having taken it to the camp, we placed it with a bitch, which had pupped but a few days before. By holding it in our hands it sucked with great earnestness, and we much hoped thus to be enabled to rear it and tame it; but after some days it sickened, and, refusing to take farther nourishment, soon died. After leaving this valley, in travelling westward, we did not again observe the 'prairie dog.'"—(Dr. Kennerly.)

The prairie dog of the Americans; perrito del campo of the Mexican; tlui of the Apaches.—This singular animal is known to all western travellers, but there are some features in its history still left to be elucidated. Do they wander, and, if so, is it in a certain direction? If they remain stationary, what do they live on? Are the rattlesnake and the smaller ground-owl (*Athene hypugaea*) constant house-mates of the prairie dog? If so, what object makes such heterogenous animals live together?

There are not yet enough data on record to answer these questions conclusively; on the contrary, every attempt to do so proves only how little we know about them. That the dog towns should be entirely permanent seems to be an entire impossibility, for the destruction of vegetation, which such a marmot settlement causes all around, is so complete that nothing is left within the limits of it on which these animals could depend for any length of time.

"From what I have seen of these marmot settlements, I believe that, after one stretch of soil is used up, an adjacent portion on either side is taken possession of. The social character of the animal causes this to be done *en masse*, and thus the town will be extended in some direction. It seems not probable that the prairie dogs abandon their settlement entirely; this is at least not corroborated by careful examination. Their burrows are the only defense these animals have, and therefore they never dare leave them at a great distance. They want their holes near by where they feed. Long drought and sterility favor the extension of their towns."—(A. Schott.)

38. CASTOR CANADENSIS, Kuhl (p. 355.)—American Beaver.

This well known species was found in abundance on the Rio Grande of Texas and the Colorado river of California.

1337. Colorado Bottom, Cal. A. Schott.—1003. Upper Rio Grande. J. H. Clark.—1415. Matamoras, Mex. Dr. Berlandiere. Skull.

The beaver; pen of the Yumas; pin of the Cocapas.—The abundance of this species on the Gila, but especially on the Colorado del Oeste, makes it a very prominent feature in the fauna of the country. On a reconnoisance down the latter river to its mouth, we passed miles and miles of river banks, which are inhabited, fortified, and covered over by the labor of this singular animal.

We had, however, no opportunity of observing any of that celebrated, almost miraculous, regularity and ingenuity with which, according to general belief, the dens and dams of the beaver are constructed.

Like the aerial nest of the Colorado tree rat or the amphibiously placed stronghold of the muskrat, the beaver's dwelling-place forms also a chaotic heap of drift wood, rush, and mud.

In those nests which have come under our eyes, only one hole communicating with the out and inside could be observed. Whether there are more, and especially sub-fluviatile openings, I am not able to say, though I doubt it, according to what I have seen of beaver life. Of that celebrated ingenuity and those architectural efforts of the beaver I could not learn any particulars. All the skill exhibited in erecting and locating those huts prove but a certain amount of instinct, of which many other mammals possess a similar share, and in which especially birds and insects are far ahead.

The most elevated point on our boundary line where beaver life came to our knowledge is the Guadaloupe cañon, (Sierra Madre,) about 5,000 feet above salt water. The lowest beaver habitation was seen by ourselves, about 30 miles above the mouth of the Colorado, where the last timber gives way to those unbounded cane-brakes and salt marshes which border the head of the Californian Gulf.

39. GEOMYS CLARKII, Baird, (p. 383.) Pecos Gopher.

This species thus far has only been found near Presidio del Norte and on the Pecos river, where several specimens were obtained.

6. Presidio del Norte. Major W. H. Emory. Skin. J. H. Clark.

40. THOMOMYS UMBRINUS, Baird, (p. 399.)—Sonora Gopher.

If I am correct in the identification, this species was first described from a specimen collected at "Cadadaiguias, Louisiana," a locality of which I can at the present day find no trace. It appears to be quite abundant in New Mexico and Sonora, although its precise range is not yet well ascertained.

154. Fort Webster. J. H. Clark. Skin. J. H. Clark.—149. Santa Cruz, Sonora. Skin. J. H. Clark.—1036. Espia, Sonora. Skin. Dr. Kennerly.—?1331. Santa Isabel, California. November 26, 1854. Skin. A. Schott.

"Though traces of this animal may be often seen in the alluvial soil of the mountain valleys in northern Mexico, it is very inconspicuous itself, being nocturnal. It seldom exposes the whole of its body above ground in daylight. On coming to the surface, if the grass is sufficiently near to be reached, it seizes a sprig and drags it within the entrance, and with its fore feet packs it away in its pouches; when this operation is completed, the opening is filled up with loose earth, which has been aptly described by suggesting its resemblance to the "emptied contents of a flower-pot." If there is no grass near its opening, it will sometimes come entirely out, when it can be easily bewildered and captured. The surface gives way under the foot where this pouched rat has been at work; it is not the species, however, that burrows so extensively in the prairie and piles up the large hollow mounds, the cause of many an inward curse to the inexperienced traveller "[1]—(J. H. Clark.)

"This animal had its hole on a grassy spot on the bank of the Corralitas river. For several successive mornings before sunrise it was observed to come cautiously out to gather grass and roots, and carry them into his den, never, however, venturing more than a few feet from the entrance. It seemed always to be uneasy and apprehensive of danger, and at the slighest noise or motion on our part it immediately disappeared, after the lapse of some time returning, first protruding its head and reconnoitering. When it was killed its pouches were filled with grass, but the manner in which it was put there could not be seen. The hole in which it lived was perfectly smooth, and did not go straight down, but inclined considerably, and apparently did not extend far beneath the surface. Near by was a pile of dirt which had probably been removed from it."—(Dr. Kennerly.)

41. THOMOMYS FULVUS, Baird, (p. 402.)

This species was first obtained by Dr. Woodhouse in the San Francisco mountains of New Mexico, and appears to be confined to the regions west of the Rocky mountains.

1330. Fort Yuma, California. January 2, 1855. A. Schott.

---

[1] These remarks may possibly apply to the *Geomys clarkii.*

"The specimen of our collection was obtained on the sandy banks of the Colorado, not far below Fort Yuma. I found it slowly moving upon the drifting sand between the river thickets formed by willows, cotton trees, bacharis, and tessaria. As it did not seem to notice much my approach, I concluded that this animal must be weak-sighted in daylight and probably nocturnal in its habits."—(A. Schott.)

42. DIPODOMYS ORDII, Woodhouse, (p. 410.)—Kangaroo Rat.

This species was first described by Dr. Woodhouse from specimens collected at El Paso, the same locality as that of the boundary collections.

560. El Paso, Texas. J. H. Clark.—1044. Mesilla valley. 1855. Dr. Kennerly.—143. Santa Cruz, Sonora. J. H. Clark.—372. Durango, Mexico. Dr. T. H. Webb.

"This species inhabits loose or sandy soil habitually, where may be seen piles of dirt of an oval shape scattered here and there each of which would fill a cart. These heaps of dirt are hollow, and have several entrances about the base, which are much larger than the animal. Sometimes, after the habitation seems to be completed, the dirt is brought out of these holes and deposited at a distance of several yards. Their labor is done almost entirely at night, and they are but seldom seen by daylight. The piles of dirt readily give way under the foot, and a mule or horse will shrink from them with as much fear as they do from a rattlesnake. I could never succeed in frightening out the occupants by running sticks into the entrances or knocking the heaps in. Rattlesnakes are often seen in the holes, which form a constant and secure retreat for all the lizards."—(J. H. Clark)

43. DIPODOMYS AGILIS, Gambel, (p. 414.)

It is with some hesitation that I refer the specimens collected by Mr. Schott to this species, as they are too young to furnish any very satisfactory indications.

1348. Fort Yuma, California. In alcohol. A. Schott.

44. PEROGNATHUS PENICILLATUS, Woodhouse, (p. 418.)

1332. Colorado river. February 22, 1855. A. Schott.—1333. Fort Yuma. A. Schott.—Colorado desert. In alcohol. A. Schott.

45. PEROGNATHUS HISPIDUS, Baird. (p. 421.)

Of this species several specimens were collected at Matamoras, and it probably extends further north into Texas.

577. Charco Escondido, and 576. Matamoras, Mex. Lt. Couch.

46. PEROGNATHUS FLAVUS, Baird. (p. 423.)

This species is found quite abundantly throughout the west, from the lower Rio Grande to El Paso, and a considerable distance westward. It also extends through the Rocky mountains to he Missouri river.

1043. San Antonio to El Paso. Major Emory. In alcohol. Dr. C. B. Kennerly.—1041. El Paso to Los Nogales. In alcohol. Dr. C. B. Kennerly.—148. El Paso. 1851. Col. Graham. J. H. Clark.—2623. Chihuahua. Dr. T. H. Webb.

47. MUS TECTORUM, Savi. (p. 441.)—White-bellied Rat; Roof Rat.

Of this species of rat, specimens were collected at Cadereita, New Leon, by Lt. Couch, and skulls, apparently of the same species, are in the Berlandier collection from Matamoras.

"The people of the neighborhood of Fort Duncan talk of a three years' cyclus, during which the appearance of hundred thousands of rats is repeated once. According to the description given to me, I think the animal to be of the species above mentioned.

"Some of the soldiers who had been engaged in making the excavations for the groundworks of some of the buildings during one of these 'rat years' told me that they could easily kill every morning from thirty to forty of these rats, which had descended or tumbled down into these diggings without being able to scale again the vertical walls.

"According to further statements these animals seem to disappear again suddenly, after which hundreds and thousands can be found lying dead over the surrounding table lands. The decaying matter then renders the infected atmosphere almost insufferable."—(A. Schott.)

48. REITHRODON MEGALOTIS, Baird. (p. 451)

Sp. Ch.—Largest of North American species. Head and body from 2.50 to 3 inches; tail about two-tenths shorter. Hind foot near .70. Ears large, moderately clothed with hair. Above mouse gray, lined with darker, and tinged with rusty; on the rump and sides a fulvous wash. Beneath soiled yellowish white.

Two specimens of *Reithrodon* were collected by Dr. Kennerly between Janos, Sonora, and San Luis spring, which I cannot readily refer to any of the described North American species. In size they exceed any of their congeners in the United States, being nearly as large as a *Hesperomys*. The ears are conspicuously large and broad, projecting far beyond the fur. They are not so thick as in *R. montanus*, and not quite so thickly clothed with hair; more so than in *R. lecontii*. The hind feet are moderately long; soles hairy to the first tubercles. The tail is about as long as the body, exclusive of the head; it is well clothed with hairs, concealing the annuli.

The upper parts are somewhat of a mouse color, lined with darker, and with a rusty tinge on the rump and sides; this is tinged with fulvous. The under parts and feet are of a soiled yellowish white. This animal has a much shorter tail than the California species. The ears are considerably larger than in *R. montanus* and *lecontii*.

1039. Janos to San Luis spring. Mounted. Dr. Kennerly.

49. HESPEROMYS TEXANUS, Woodhouse. (p. 464.)

This species is so closely allied to the *H. leucopus* as to be distinguished with difficulty.

? 145. El Paso, Texas. Col. Graham. Skin. J. H. Clark.—1037. Turkey creek, Texas. Nov., 1854. Major Emory. Dr. C. B. Kennerly.—579. Charco Escondido, Mex. Lieut. Couch. Skin.

"In passing through a groove of live oaks (*Quercus virens*) in the valley of Turkey creek, late in the afternoon, we observed near the top of one of the trees a nest built of leaves closely resembling those sometimes constructed by the common Carolina squirrel. Being desirous of ascertaining whether there was any animal in the nest we discharged our rifle at it, which resulted in the two mice presented being dislodged from it. We knew of no reason why, in this locality, they should have abandoned the usual habits of their kind, and selected this position instead of building their nest in the ground, under stones, or in old logs."—(Dr. Kennerly.)

50. HESPEROMYS SONORIENSIS, Leconte, (p. 474.)

144. Santa Cruz, Sonora. 1851. J. H. Clark.—9. El Paso, Texas. J. H. Clark.

"This animal seems to live, as circumstances may determine, either in the ground or in the hollows of trees. A specimen obtained from a 'hollow' of a cottonwood tree had a snug bed made of the fine filaments or inside bark; in this there was apparently no provision made for a family, or even for a companion. This seclusion is not probably peculiar to the genus but only the freak of a disgusted or selfish individual.

"This, or an allied species, builds globular beds of fine grass, lined with feathers and other soft material, on the Opuntia and other chapparel. They are quite numerous in some sections, and, seen at a distance, hanging on thorny branches, resemble old bird nests. The entrance, usually at the side or bottom, is, to all appearance, so entirely closed as to suggest the question, by what built, and for what purpose is such a contrivance? I never saw one in an unfinished state, nor the animal at work—labor is perhaps performed after night."—(J. H. Clark.)

51. HESPEROMYS EREMICUS, Baird (p. 479.)—Desert Mouse.

This strongly marked species has hitherto only been found at Fort Yuma and its vicinity. 1334. Colorado Bottom, Cal. A. Schott.

52. NEOTOMA MEXICANA Baird (p. 490.)—Bush Rat.

1083. San Pedro R., Sonora. Dr. Kennerly.—1328. ♂ Colorado bottom, Cal. March 31, 1855. A. Schott.

"The only specimen of this species observed by me was procured near the San Pedro river on a bluff, where it had built its nest among the rocks. Evidences of its presence were perceived in great quantities of excrement around the spot; and, after removing a few stones, its nest was found, and the animal easily captured. The nest was composed of a compact bunch of dry grass.

"The food of this animal consists partly, perhaps, of the cactus and its fruit, which grew in abundance in this locality."—(Dr Kennerly.)

"*Raton of the Mexicans; Lotronce, of the Apaches; Amalj, of the Yumas.*

"This animal is most common in the bottom lands of the Lower Colorado, and most probably in corresponding localities on the Gila.

"It builds its domicile between the forks of mezquite trees, the deflexed ramifications of which usually form a natural defence against larger intruders. The nest itself is made up of dry sticks, such as the ground underneath such trees is strewn with There is no regularity in the construction of this house, which resembles, on a smaller scale, those of the beavers. The only difference is, that the rat builds his house above freshet-mark. As a common inmate of those rat nests is also a *Sceleporus*, perhaps, *Sc. collaris*, which has its entomophagous sports upon the rough bark of the mezquite tree. Thus the rat and the lizzard live peaceably together.

"The principal food of this rat seems to be the pods of the mezquite and the screw bean, of which often large depositories can be found in their strongholds.

"The animal seems to avoid carefully any contact with water, and therefore likes to build its nest above the reach of water. Being obliged to live for some months on deposited food, its habitation necessarily must remain perfectly dry.

"For the Indians, Yumas and Cocopas, living in the Colorado bottom, this tree rat is of some importance. As they do not hunt, they depend on the meat of this rat for that small portion of animal food they want. In spring, that is, in February and March, the rat nests are carefully searched by the Indians. It was in this season that when, after some of us had refused the offer of an Indian to sell us some of this delicacy, he assured us in his peculiar Indian-Spanish, 'mucho bueno por comer;' and then went to my camp-fire, and, after killing one or two of his long-tailed prisoners, placed it, without any cleaning, into hot ashes. After a quarter of an hour the dish was ready, and required only a little salt to make it palatable to the native consumer."—(A. Schott.)

53. NEOTOMA MICROPUS, Baird (p. 492.)—Black Wood Rat.

554. Charco Escondido. Mexico. 1853. Lt. D. N. Couch.—561. Santa Rosalio, Mexico. Lt. Couch.

54. SIGMODON BERLANDIERI, Baird (p. 504.)—Texas Cotton Rat.

8. West of San Antonio. Skin. J. H. Clark.—233. Eastern Texas. Skin. J. H. Clark.—2682. Ringgold Barracks. A. Schott.—1034. Los Nogales, Sonora. Dr. Kennerly.

"It sometimes inhabits the vicinity of water courses, seeking the tufts of grass usually growing here as a place of retreat. It also burrows into river bluffs and banks of ravines; its burrows, however, are more properly some sun-cracked crevice or water-washed hole, which is apparently selected at times with reference to some adjacent rank vegetation. Sticks, feathers, and other foreign matter are collected about its habitation, which is otherwise marked by clean and well beaten paths, sometimes forming a sort of tunnel through leaves and fallen weeds and grass. Like the Norway rat, it seems to be omnivorous, and is a day as well as a night feeder. The specimens obtained were shot as they skipped from one cover to another."—(J. H. Clark.)

"This species was quite common at Los Nogales, but we did not observe it in any other locality. It lived in the ground, in the immediate valley of the stream where the soil was of a soft alluvial character. It frequented the places occupied by the cooks, and its depredations often amounted to annoyances. It was not entirely nocturnal in its habits, but frequently made its appearance during the day time, and was not very shy."—(Dr. Kennerly.)

55. FIBER ZIBETHICUS, Cuv. (p. 561.)—Musk Rat.

No specimens of this species were collected by any member of the commission.

"During my whole journey along the boundary line I only saw one specimen of this interesting genus. It was killed in the low marshes of the Gila, near Fort Yuma. The ball had taken off the animal's head entirely.

"To conclude from the number of tracks we saw on the Gila and Colorado, and also on the Rio Bravo, the Ondatra cannot by any means be rare.

"In one nest which we accidentally opened in the bottom of the Colorado, and supposed to be the habitation of a musk rat, we found a large store of screw beans, on which the animal seems to feed in winter time."—(A. Schott.)

56. LEPUS CALLOTIS, Wagler (p. 590.)—Jackass Rabbit; Texas Hare.

Sp. Ch.—Size large; limbs very long. Ears much longer than the head. Fur variable; fuller in winter and on high table lands, thinner in summer. The dorsal region mixed reddish yellow or light cinnamon and black; the hairs grayish white at the base; sides and fore part of chest and throat paler, with much less black; buttocks, sides of the rump, and external surface of hind legs ash gray, finely and faintly lined with dark brown, which, on the buttocks, appears arranged in lines somewhat parallel to the outline of the longer fur of the back; upper surface of the tail, with a line on the rump, black; rest of the tail ash gray; beneath, smoked white. Ears, with the posterior edge, white; this color also visible on the interior face of the ear, except the external band, which, with the internal, is grizzled pale cinnamon yellow and brown; end of the ear with a brown edge corresponding to a dark terminal patch on the dorsal surface. Nape and neck above either black or grayish; in the former case the base of the ear behind is dark brown; in the latter it is white.

No. 252.—Body long and slender; limbs very long, ears very long, much longer than the head; tail of moderate length; legs slender, the fur compact and short; claws very long and sharp, nearly straight, projecting beyond the pads.

General color of the back a light brownish yellow, with a slight shade of cinnamon varied with black; somewhat similar on the sides, but paler, with less admixture of black. The nape is dark sooty brown. The upper chest and throat are dull brownish yellow; the sides of the rump and buttocks, the tibial region all round, and the outer surfaces of the fore legs, light ashy or bluish gray, finely and faintly marked with parallel lines of black, caused by the black tips of interspersed hairs. The tail is ashy white beneath and on the sides; black above, the color running up on the rump for two inches. Inferior surface of the body, anterior face of the hind feet, posterior edge of the fore legs, and the inferior surface of the head, white, with a tinge of smoky; most decided exteriorly and on the inside of the thighs; a whitish spot on the top of the head; the pads of the feet light dull brownish yellow. The internal and external bands of the ear are pale brownish yellow and black, finely mixed; the external fringe and the remaining portion of the outer surface of the ear, or its concavity, is unicolored brownish yellow, darker towards the top. The posterior edge is yellowish, or creamy white, except for about half an inch from the tip, which is dark brown. On the posterior surface or convexity the ear is sooty brown for half an inch from the tip (not on the external band) and at the base, the color extending on the posterior edge of the latter, or for nearly two inches. Of the remaining portion, the inferior half is pale fulvous, shading superiorly into ashy.

On the back the fur is light ash gray at the base, then black, then brownish yellow, and finally tipped with black. On the lower part of the sides the black changes into a light brown. On the posterior portion of the dorsal surface the bases of the hairs on the median region are lead color; more laterally this becomes lighter, and the dorsal portion nearly white. The grey hairs on the buttocks are much shorter and more compressed than the adjacent region of the back.

A specimen, No. 135, collected at Eagle Pass, Texas, by Mr. Schott, in the summer of 1852, agrees in every respect, except in having the back of the neck entirely destitute of the dusky brown of the one first described. This is of a brownish yellow, the color showing on the base of the ear. The black annulation of the fur above is less extended and less intense. The ears are more cinnamon in tint, and the black at tip is a little greater in extent. The legs appear a little thicker and the pads fuller, the claws not quite so long and sharp; the ears are no longer in proportion.

No. 134, likewise collected by Mr. Schott, at Eagle Pass, agrees with No. 252 in the dusky nape and the black base of the ears. The black on the back is, however, more like No. 135, or less distinct than in 252, and the fur on the anterior portion of the back is more dusky at the base. The claws are shorter, the pads rather fuller, and their color much darker, or a dirty reddish brown.

A specimen from Northern Mexico. Charco Escondido, collected in the spring of 1853 by Lt. Couch, U. S. A., bears a close resemblance to No. 252; but the ears are much longer in proportion, as will be seen from the table of measurements. The colors above are clearer, the brownish yellow lighter, the under surfaces of the feet darker; the tail, too, is rather longer; no other differences discernible. The nape and base of ears are dusky black.

A single pair of ears from Mr. Jennings, Austin, Texas, are larger than those of any specimen examined. I can detect no special difference from the others, except that the colors are purer, the black at the end of the ear covering an inch and a half from the tip, the inner surface, except the external band, pure white to the base.

Thus far, no specimens received in Washington seem to correspond to the *Lepus texanus* of Aud. and Bach. The characteristics of the specimens above described cover those of *L. texanus* to some extent. It will be seen that specimens with black napes have the ears varying by an inch, the largest nearly six inches. All have black tips to the ears, of greater or less extent, although authors give the black ends as peculiar to *L. californicus* and *texanus*. Specimens with the ears of the same proportional size have black napes or gray. The nearest approach to *L. texanus* is seen in a scalp with ears, brought from Red river by Capt. Marcy. Here the colors are more rufous than in any of the others; the nape is pale rusty; the base of the ear white; the tip brownish black, except on the external band. The ears measure 5 inches 2 lines posteriorly, and 4 inches 3 lines from the notch.

A young specimen, collected at Charco Escondido by Lt. Couch, has much the same distribution of color above as the adult. The fur, however, is fuller and brownish lead color at the roots, then brownish rusty, then black, then reddish yellow; some of the hairs, in addition, have black tips; towards the sides the base of the hairs becomes lighter. Upper part of tail and rump, black; abdomen, beneath, pure white, like cotton; beneath the head and anterior surface of hind feet grayish white; inner surface of the limbs ashy gray; the neck beneath rusty gray. Pads of the feet bright brownish red. Nape dusky, much as in the adult, but the colors less bright.

Total length, 11 inches; ears, two inches 2 lines, but little longer than the head; hind foot, 2 inches 9 lines.

Measurements.

	No. 252. Brazos, Tex. Black nape.	No. 135. Eagle Pass, Tex. Gray nape.	No. 134. Eagle Pass, Black nape.	No. 299. Charco Escondido. Bl'k nape.	Llano Estacado. Gray nape.	Austin, Tex.
To base of ears	4.00	4.25	3.83	4.08	....	....
To base of tail	21.75	24.50	19.50	19.75	20.00	....
Tail to end of vertebrae	1.58	1.75	Broken.	2.25	2.25	....
Tail to end of hairs	2.75	2.83	Broken.	3.25	3.17	....
Ears posteriorly	5.17	5.42	4.83	5.83	5.25	6.25
Ears anteriorly	4.75	5.07	4.50	5.58	....	....
Ears above notch	4.00	4.58	4.25	4.93	4.75	5.00
Fore arm	5.00	....	4.17	....	....	....
Fore foot	2.25	2.93	2.17	2.17	....	....
Tibia	5.25	5.83	....	....	....	....
Hind foot	4.58	4.58	4.58	4.58	4.75	....

"The 'jackass rabbit,' so called because of its great ears, is the only mammal, excepting the wolf, that occurs abundantly on the naked prairies. It is easily put up, for it usually seeks no other protection or hiding place than a little scratch in the ground in the shade afforded by some stunted bush. Does not squat so readily as the *Lepus virginianus*, and never burrows for protection like *L. Artemisia*. In certain sections, during the winter, the coarse and stinking creosote plant constitute almost its only food. Its subsistence on such diet is evidence of its hardihood, and proves its capability of existence where most animals of its kind must perish. The traveller is at times glad to obtain it for food; yet its flesh is hard and dry, and sometimes highly, but not always pleasantly, flavored. Its great swiftness prevents it from falling an easy prey to wolves. I on one occasion saw this rabbit pursued by some large hawks; they seemed to be wary of their power to capture it, and did not attempt to seize it while in my sight. In plazas and other places, well beaten paths indicate the favorite haunt or play ground of this timid but watchful animal. When suddenly started up, especially if it is much frightened, its body is brought into a semi-circle, with ears laid close back, and its vigorous leaps are continued in one direction but a few hundred yards; it thus overcomes space under great disadvantages; its course, ordinarily even, is very zig-zag. If going at an easy jump its ears are thrown forward, reminding one of the flapping appendages of its prototype, jackass, unless endangered by the thorny vegetation; its prodigious leaps, which clear it of most of the flora in its habitat, however, save the trouble of any especial care in this respect. The contrast of color—black and white—about its tail and head is quite decided when running from you, the position in which it is usually seen. Its skin is as tender and it is as easily killed as other hares. It brings forth but two or three young at a time, and not till late in summer, so far as my observation went."—(J. H. Clark.)

57. LEPUS CALIFORNICUS, Gray (p. 594.)—California Hare.

One specimen of this species was collected on the lower Colorado river of California, by Mr. Schott.

58. LEPUS SYLVATICUS, Bachman (p. 597.)—Gray Rabbit.

A specimen, probably of this species, was collected at Indianola, Texas.

59. LEPUS ARTEMISIA, Bachman (p. 602.)—Sage Rabbit.

This species is abundant through Texas and New Mexico.

315. San Antonio to El Paso. J. H. Clark.—1417. Matamoras. Lt. D. N. Couch.

"Wherever the thorny clumps of chapparal and the loose sandy soil afford protection to this smallest of rabbits, it may be found in great numbers. No matter when or where one of these may be seen, a clump of chapparal or its burrow seem always at hand; thus it does not travel far, and a few jumps brings it to a place of safety. Notwithstanding this, it forms the principal animal food of the coyote. The burrows usually run into sand hillocks formed around bushes; sometimes, however, they are dug into the bare compact surface. Both this species and the *Callotis* seem to be lean in all localities, and under all circumstances, never having seen a specimen of either showing a deposit of fat around the kidney, so common on the *L. virginianus* in fall As an article of food it is superior to the *Callotis*, but not equal to the common hare; and on the lower Rio Grande, a region fertile in game, where it is particularly abundant, the people do not think it even worth the knocking over with a stick."—(J. H. Clark.)

60. LEPUS BACHMANI, Waterhouse (p. 606.)—Bachman's Hare.

Specimens of this species were collected at Brownsville, Texas, by Lt. Couch and Capt. Van Vliet.

61. DASYPUS NOVEM-CINCTUS, Linnaeus (p. 623.)—Texas Armadillo.

Sp. Ch.—Tail as long as the body, exclusive of the head. Shell of the back a little wider than long. Eight movable rings in the middle of the shell, and a ninth partly free on the sides. Tail covered with jointed whorls for its basal portion; the terminal third plated but not sheathed. Color blackish. Molars 32.

Description of a young specimen in alcohol.—The head is very much rounded at the vertex, but produced into a rather narrow truncated muzzle, the sides of which, viewed from above, are concave; the upper outline nearly straight from behind the eyes to the tip. The ears are broad, long, obtusely acuminate, and situated entirely on the occiput, their bases in contact. They are barely less than half the length of the head. The eyes are small; considerably nearer the occiput than the nose. The nostrils are entirely terminal, horizontally crescentic, the concavity superior; the broad truncated muzzle, with the nostrils separated by a rather wide septum, resembles very closely that of the hog.

The legs are very strong; the anterior projecting from the body quite as much as the posterior, and of equal thickness. On the fore feet there are four fingers without the slightest rudiment of a thumb; the toes very short; scarcely projecting in any of the feet beyond the thickened skin. The two central fore claws are much largest; the inner and outer much smaller and equal; the former more posterior, not reaching the base of the adjacent claw. The hind claws are rather shorter; the third longest; the second and fourth equal and opposite; the first and fifth also equal and opposite, and considerably further back. The tail is long, and tapers regularly to an acute tip; it is as long as the body, exclusive of the head.

The entire body is covered with tessellated bony plates; those on the back arranged in sheets, which come low down on the sides, but do not extend on to the belly. Of those there is one continuous sheet on the anterior third of the body, cut out so as to fit round the back of the head; the middle third is occupied by eight half rings, nearly equal to each other; and the posterior third is again covered by a sheet of plates extending to the tail, and fitting down over the rump and thighs. The connexions between these sheets and rings are formed by a skin covered with minute tessellations, and permitting free motion. In addition to the eight rings described, there is a slight indication of a ninth posterior one, which, however, only becomes free and open on the lower part of the sides. The tail is enveloped in whorls of plates, of which twelve may be counted from the base, each one composed of two or three single whorls or annuli between successive joints, the posterior one with the plates more elongated; after this the plates become imbricated, as in a plaited whip lash, without special joints. The plates on the top of the head are sub-hexagonal, and of nearly equal size. Those on the shoulders and rump are rounded, and chiefly arranged so that one larger plate is surrounded entirely by smaller ones; the plates on the rings are narrowly elongated triangular, the apices and bases of the triangles alternating.

As stated, the entire exterior of the animal is covered with plates; those on the ear smallest; the under and inner surfaces are covered with granulations, arranged in transverse series. A good many short stiff scattered hairs are seen to project from the under surface, as well as from the edges of the sheets and annuli above.

In five specimens before me from Texas, three very young and two adult, there is a very great constancy in the arrangement of the rings on the middle of the body; of these, eight separated narrow ones are visible on the middle of the back, and nine when counted on the side. In a shell from Brazil, (2,195.) the breadth is greater in proportion, and there are nine separated annuli above. The sculpturing also is slightly different. It is not at all impossible that a careful comparison of perfect specimens from Texas and South America may reveal specific differences.

The skull has eight molars in each side of each jaw, or thirty-two in all.

The nine banded armadillo has thus far been found to occur in the territory of the United States only on the Lower Rio Grande, although extending southward through Mexico, and if identical with South American specimens, into Brazil and Paraguay.

2859. Matamoras, Mexico. Lieut. Couch.—230. Lower Rio Grande, Texas. J. H. Clark.

"The inhabitants of the former Spanish colonies know the tatou commonly as the *Armadillo* or *Encubierto*. The people of the country esteem its flesh; and the women attribute imaginary properties to its shell. This animal is mostly nocturnal in its habits, rarely going out by day, near the settlements, except to search for food. It delights to dig large holes in the earth, where it conceals flesh and vegetable substances. A viscous and transparent humor almost continually drops from its mouth. This edentate is naturally stupid. It is gifted with extraordinary strength, and when it has once taken hold in its burrow, it is more easily torn to pieces than pulled out.

"I have sometimes seen these animals elevate a weight placed on their backs of almost a hundred pounds.

"As the movements of this animal are very awkward, it seldom escapes the hunter who pursues it on the open plain; but in the mountains it rolls itself up, and thus transformed into a ball, on a declivity rapidly disappears, rolling over the stones.

"A specimen of which I made a description was kept two or three months in our house. It frequented the kitchen, where it lived on the refuse; and if it came out sometimes in the day from its den, which it had dug in the earth, it was not long before it returned again to it.

"At will this animal can entirely conceal its head between its legs, as when it sleeps or when it is attacked."—(Berlandier)

"The occurrence of this animal any distance east of the Rio Grande is probably unknown, nor is it found higher up on this river than the vicinity of Ringgold Barracks. It lives mostly in and about the banks of the river and the many lakes or old river beds. It sleeps, for the most part, during the day, so drawing itself up that all of the few vulnerable parts are completely protected by its armor. Among the inhabitants it is much sought after as food, and is considered a delicate dish. Its flavor is similar to that of the "possum;" but less fat, more delicate, and altogether more palatable. It is inoffensive, has a gentle disposition, and can be handled with impunity. Once in the hands of its captor, it will play possum, allowing itself to be carried leisurely by the tail, so that an unexpected and spasmodic jerk, such as it only is capable of giving, will release it from the most vigorous grasp, particularly if there is any support for its feet. So rapid and vigorous are the movements of its powerful claws, that but a few minutes are necessary for the animal to melt away from your view in the most compact soil."—(J. H. Clark.)

62. DICOTYLE TORQUATUS, Cuv. (p. 627.) Texas Peccary.

This species was occasionally met with by the Commission along the Rio Grande, but under circumstances when it was not convenient to preserve any skins.

"This annimal habitually lives in the bottom lands of the water courses; it is not confined to such places, as it is not unfrequently seen on the prairie singly, or in a drove. Many stories are told of its ferocity; of its attacks without provocation; no manifest evidence of such a disposition came under my observation, though I have seen it chased and wounded repeatedly. In open ground it is somewhat shy, and for a hog runs with fleetness; and when pursued will dodge and squat with at least as much facility and success as a jack-ass rabbit. Its vicinity is easily detected by an odor, which, though less intense, is not much less offensive than that of the skunk. There is a swamp near Ringgold Barracks that perfumes the whole neighborhood with the odor of the peccary, and is known as the "wild-hog den," by which name (wild-hog) it goes among frontier men. The Mexicans apply to it the same term (moran) that they do to the domestic hog. Live Oak creek, a rivulet emptying into the Pecos near its lower crossing, is noted for the great number of peccaries inhabiting its course.

"The food of the peccary in southwestern Texas consists mainly of acorns and pecans; further west, and in higher regions, these sources of subsistence fail, and the occurrence of the animal is consequently rarer. The absence of any largely developed posterior appendage, usually designated as the tail, is the most characteristic and striking feature, not excepting the secretory sac, resting skin deep only on the rump, and which emits the odor. Neither the immediate removal of this sac, nor any other precaution or process, could render its lean and stringy hams palatable. Like the domestic hog, it both wallows and roots; the meagre traces in these respects show that the wild hog is less industrious than its domestic representative."—(J. H. Clark.)

"The peccary is not an uncommon animal in southwestern Texas. It is met with in greater or less numbers along all of the streams, and is especially numerous along Devil's river, Live Oak creek and the Pecos river. West of the Rio Grande we observed them only at San Bernardino.

"They are almost always associated in herds, composed of from five to ten individuals, and are very rarely found alone. They prefer the thickest and most impenetrable bushes, from which they are not easily driven out. In the localities where they are very numerous, their proximity, especially after sunset, may be discovered by the peculiar order which they emit, and which is not entirely unlike that of the skunk, (*Mephitis,*) though of less intensity; this we particularly observed in travelling up the Pecos river.

"They sometimes become quite vicious, and might prove a dangerous antagonist on account of their sharp tusks and great activity.

"If one of a herd is wounded, the remainder will often turn and attack the assailant with great fierceness and desperation.

"In their choice of food they seem to give preference to pecans, walnuts, and acorns, though they also eat roots and other substances."—(Dr. Kennerly.)

63. CERVUS VIRGINIANUS, Boddaert, (p. 643.) Virginia Deer.

This species is abundant in many parts of Texas, though no specimens were collected.

"On the prairies near the coast this animal supplants the antelope and the black-tailed deer. It may be seen here grazing among the cattle of the settlements, where it is wilder and more difficult of approach than in wholly unfrequented regions. On the plains of northwest Texas and further westward the occurrence of the common deer is somewhat rare, and principally confined to the water-courses, where, besides the water and grass, is the additional attraction of trees and bushes, which serve as protection from the northers in winter and from the heat of the sun in summer. In the country lying between the Nueces and the Rio Grande, more deer were seen in one day than a week's travel disclosed in any other region traversed by the Boundary Commission. It is less gregarious than the antelope, but more so than the black-tailed deer; this latter prefers mountainous regions, and is never seen in company with the red deer."—(J. H. Clark.)

64. CERVUS MEXICANUS, Gmelin, (p. 653.) Sonora Deer.

"The Virginian deer, so common throughout the entire State of Texas, and particularly its southwestern portion, was also observed by us in considerable numbers in various localities west of the Rio Grande. Indeed, we believe that few species of animals are so generally spread over the entire continent as this, and at the same time in such great numbers. It was observed in the valleys of all the streams passed by us in our journey from El Paso to Los Nogales, as well as in the various mountain ranges, particularly the San Luis and Sierra Madre. In the valley of the Santa Cruz river and the adjacent country we found them in such numbers as to influence the belief that a few skilful hunters might have supplied our entire party with fresh meat.

The Mexicans of this region, having but few fire-arms, and being very much afraid of the Indians, do not often hunt them. Indeed, thirty miles west of the village of Santa Cruz, these animals seemed to be so unaccustomed to the sound of a gun that we have known them, when the hunter was concealed, to be fired at several times before becoming sufficiently alarmed to take flight.

"During our stay at Los Nogales in the month of June, particularly the latter part, the heat during the day was quite oppressive; and the valleys of the streams, with their thick undergrowth affording a good protection from the rays of the sun, were the favorate places of resort for these animals. Very early in the morning they were found feeding on the hills, but retired under the shelter of the bushes about ten o'clock, after which time they could be killed as easily as rabbits, by the hunter passing through the undergrowth with a gun charged with buck-shot. They would rarely spring from their concealment until approached within twenty paces.

"At this season, June, the horns of the bucks were but a few inches in length, and the females generally far advanced in pregnancy. We observed often the young of the previous year still following the doe, which was about to bring forth another progeny."—(Dr. Kennerly.)

65. CERVUS MACROTIS, Say, (p. 656.) Black tailed Deer.

"We did not observe this animal until we reached the vicinity of the valley of the Corralitos river, and here it was not very common. It was rarely seen in the immediate valley of the river, except late in the afternoon, just before sunset, when it came to drink, but preferred the neighboring mountains or hills. In the San Luis mountains and the Sierra Madre they were very numerous; but we noticed, while near these localities, that this species is much more apt to be driven from its accustomed haunts than the other, (*Cervus virginianus.*) In a few weeks, although at first equally as numerous, if not more so, than the latter, it disappeared almost entirely, while the red deer became only a little more shy, but its numbers did not seem to diminish.

"It is somewhat curious that we did not observe the black-tailed deer after leaving the Sierra Madre, although it is found in great numbers in California. The belt of country traversed by us, included between that mountain and the 111th meridian, seemed to be almost, if not entirely, without this animal, while in several localities the Virginian deer and antelope were both very common."—(Dr. Kennerly.)

66. ANTILOCAPRA AMERICANA, Ord. (p. 665.) Prong Horn Antelope; Cabree.

This species is abundant in Texas, although no skins were collected by the survey.

"On the plains lying between the Nueces and the Rio Grande, the great mustang range, and where the common deer is very abundant, but few antelopes are to be seen. It is not till west of the Pecos is reached that droves are observed dotting the most open and naked prairies, which it undoubtedly prefers and habitually inhabits; it is no rare occurrence, however, to find it in mountain valleys, from which it will sometimes take to the mountains, but usually from fright, not choice. Being shy, and quick to take alarm, it always keeps at a great distance. Occasionally one, either dumfounded with fear or overcome with curiosity, will come right up to a train by a series of advances and reconnaissances, while the rest of the herd are lost to the sight in an opposite direction. It is on plains destitute of most forms of vegetation except grass that the largest herds of this animal are to be found. When it is considered that such prairies cover an extent of fifty or even one hundred miles in some directions without water, its adaptability to the regions inhabited is manifest. There is no bond of sympathy between the antelope and the deer, for they are never seen herding together, and seldom occupying common ground. The absence of water and luxuriant grass in the antelope region may account in a measure for the rarity of the deer. Though much scattered when feeding quietly, a herd flocks together as it runs off. The most remarkable habit of the antelope is its tendency to take and continue but one direction in its flight; so determined and obstinate is its disposition in this respect as to be impelled across arroyos, over mountains, and even through trains. To start it as a common deer is an unheard of thing, due to watchfulness rendered easy by the openness of the country inhabited. Shades of color varying from a deep fawn to an almost pure white are observable at a distant view in the same herd Its motion is more rapid as well as more regular than that of the deer, never leaping like the latter animal. Its flesh is also juicier and finer; its superiority is appreciable even by one who can make no pretension to an epicurean taste. Frontier men have assured me that they have sabred the antelope on ordinary horses during sleety weather, when they say it is unable to keep its feet. The wonderment that this animal sometimes expresses, and its apparent inability to see things aright, leads to the suggestion of some peculiarity in the eye, either of construction or position; its location on the side of the face, and directly at the base of the horn, would impress any one with its singularity. An allusion to its preference for open prairies as a habitat has already been made. This region, it will be remembered, is the home of the prairie dog, and its dependents, the rattlesnake, the owl, and the Holbrookia. The antelope is said to have an abiding hatred for the rattlesnake, which it decoys first into a striking attitude, and then utterly annihilates by leaping into the air and coming down upon it with its four sharp-cutting hoofs placed together."—(J. H. Clark.)

"On several occasions we have travelled over the road between San Antonio, Texas, and El Paso, on the Rio Grande, but we never have observed the antelope in that country until after crossing the Pecos river, and from that stream as far as the Rio Grande found it always the most common of the larger species of quadrupeds. On the immense plains and wide valleys stretching out from the Limpia mountains in all directions large herds are often seen. The number of individuals composing a herd vary from eight or ten to several hundred. We have often seen more than a hundred together, and perhaps sometimes as many as three hundred.

"In going westward from the Rio Grande we found them equally as numerous as in the country east of that stream, as far as we travelled. In the northern part of Sonora they were very common, and for the most part less shy and more easily captured than in other localities. In the less frequented regions the hunter has only partially to conceal himself and shake his hat or handkerchief, thus attracting the attention of the animals, whose curiosity is so great as to cause them to approach within gun-shot. This approach, however, is not made without apparent caution, for while performing it they walk very slowly, often stopping, and should they get to the windward of the hunter beat a rapid retreat, and soon disappear in the distance.

"In the northern part of the States of Chihuahua and Sonora we found the females very far advanced in pregnancy about the middle of July."—(Dr. Kennerly.)

OVIS MONTANA, (p. 673.) Big Horn; Mountain Sheep.

Of this animal no specimens were collected, though frequently seen by the Commission.

"*The Mountain Sheep, Big Horn, of the Americans of California and New Mexico; Borrego cimaron, of the Sonorians; Tenatzali, of the Apaches; Tajé, of the Cochimés of Lower California.*—The rocky sierras of northwestern Sonora, where want of water not only forbids the existence of every other species of ruminant, and where even the coyote, with all his cunning and tenacity, is nearly ruled out, are the favorite home of the mountain sheep.

"The state of drainage peculiar to a country seems to establish principally the existence of one or the other species of those ruminants, which are indigenous to the regions adjacent to the boundary line.

"Thus, the common deer belongs to the more shady lowlands, the mule deer to the uplands; the antelope ranges over the open mountain table lands, whilst the mountain sheep has its home over the rugged crests of the waterless sierras of northwestern Sonora and New Mexico.

"Whilst surveying along the boundary line, I had sometimes occasion to leisurely observe these shy and comparatively rare animals upon their native ground. As usually an unarmed man is always led nearest to game, so was I on one day, walking almost side by side at eight to ten yards distance, with a large ram, which certainly stood upon his legs nearly four feet high above ground, with a length of five feet from head to tail.

"One whole afternoon, (I was waiting then for signals from another station,) a singular noise in the cliffs of an opposite mountain slope fixed my attention, and it was some hours before I was able to find out the real nature of it. It sounded as if a rock had been precipitated somewhere, and I first inclined to be satisfied with that; but as the sound, after certain intervals, was so often repeated, and the game lasted until evening, I attributed it to something else, until I seized upon the correct idea. The noise was nothing else than the result of a butting combat between two rams. On the whole of these mountain tops there was not a single horizontal or gently inclined spot where the round footprints of this animal could not be observed. In some places well beaten pathways lead up to the most rugged portions of the rocky sierras, where man hardly may trust his foot, lest he may be precipitated with the loosened detritus of weather-washed decomposed rocks. The water on which the inhabitants of these forsaken desert mountains depend are mostly but rain-water holes, (tinajas,) in which, during the hot season, water must become scarce enough.

"I have been assured by hunters that a flock or drove of these big horns, when closely pursued, will not shrink from a general leap over a precipice of one hundred and more feet deep to effect their escape. It is also stated that they do so without any risk, but escape, every one uninjured, by throwing themselves head foremost upon the heaviest portion of their gigantic horns, the spiral shape of which seems to paralyze the hardest shock. This, if not a fact, is at least generally believed. It is also not a modern invention, for Clavigero mentions the same, as he heard it from the lips of the California Indians.

"The horns of the mountain sheep are most formidable weapons for defence even against larger enemies; as, for instance, wolf or puma. The nature of the ground where the mountain sheep ranges hardly permits any ambush on the part of the aggressor, because there is no timber or brushwood. To meet a blow of those gigantic horns must be rather a risk of life; the more so, when an attacked big horn succeeds in driving his antagonist between a rocky wall and his 'battering ram.'"—(A. Schott.)

67. BOS AMERICANUS, Gmelin. (p. 682.) American Buffalo.

No skins of this species were collected by the Boundary Commission, though skulls and skeletons were frequently met with.

ALPHABETICAL INDEX.

Page.

A.

Amalj 44
Armadillo 48
Antelope 51
Antilocapra Americana 51

B.

Bachman's hare 48
Bassaris 17
Bassaris astuta 18
Bay 16
Beaver 40
Berendo 51
Bighorn 52
Bison 52
Black-footed raccoon 22
    ground squirrel 38
    tailed deer 51
Blarina exilipes 5
Bos americanus 52
Brachyphyllum cavernarum 3
Bridled weasel 19
Buffalo 52
Bush rat 44

C.

Cabree 51
California hare 47
Canis latrans 15
    mexicanus 14
    occidentalis 14
    rufus 15
Carnivora 5
Castor canadensis 40
Cat squirrel 19
Cervus macrotis 51
    virginianus 50
Cheiroptera 3
Chimbica 6
Cinnamon bear 29
Civet cat 18
Clark's gopher 41

Page.

Cotton rat 44
Cougar 6
Coyote 15
Cynomys ludovicianus 39

D.

Dasypus novemcinctus 48
Desert mouse 44
Desmodina 3
Dicotyle torquatus 50
Didelphys azarae 32
    breviceps 33
    californica 32
    virginianus 31
Dipodomys agilis 42
    ordii 42

F.

Felis concolor 5
    eyra 10
    onza 6
    pardalis 8
    yaguarundi 12
Fiber zibethicus 45
Fox squirrel 34

G.

Gato montis ravin 13
Geomys clarkii 41
Gray fox 16
    rabbit 47
    squirrel 35
Grizzly bear 24
Gymnorhina 4

H.

Hesperomys eremicus 4
    sonoriensis 43
    texanus 43

I.

Insectivora 5
Istiophora 3

Page.

J.

- Jackass rabbit 45
- Jaguar 6

K.

- Kangaroo rat 42

L.

- Lepus artemisia 48
  - bachmani 48
  - californicus 47
  - callotis 45
  - sylvaticus 47
- Line-tailed squirrel 38
- Lobo wolf 14
- Lotronce 44
- Lynx maculatus 13
  - rufus 13

M.

- Macrotus 3
- Macrotus californica 4
- Megadermata 3
- Mephitis bicolor 21
  - mesoleuca 19
  - varians 19
- Mexican badger 21
  - ground squirrel 39
  - hog 50
- Meztli 6
- Moran 50
- Mountain sheep 52
- Mule deer 51
- Mus tectorum 42
- Musk rat 45

N.

- Neotoma mexicana 44
  - micropus 44

O.

- Ocelot 8
- Opossum 31
- Ovis montana 52

P.

- Pagi 6
- Panther 5
- Peccary 50
- Pecos gopher 41
- Perognathus flavus 42

Page.

- Perognathus hispidus 42
  - penecillatus 42
- Phyllostomata 3
- Possum 31
- Prairie dog 39
  - wolf 15
- Procyon hernandezii 22
  - mexicana 22
- Pronghorn 51
- Puma 6
- Putorius frenatus 19

R.

- Raton 44
- Red wolf 15
- Reithrodon megalotis 43
- Rhinolophina 3
- Rodentia 34
- Roof rat 42
- Round-tailed squirrel 38

S.

- Sage rabbit 48
- Sciurus carolinensis 35
  - castanonotus 35
  - castanotus 37
  - limitis 34
  - ludovicianus 35
- Sigmodon berlandieri 44
- Sonora gopher 41
  - grizzly 24
  - raccoon 22
  - squirrel 39
- Sorex latimanus 5
- Spermophilus couchii 38
  - grammurus 38
  - mexicanus 39
  - spilosoma 39
  - tereticauda 38
- Striped skunk 21
  - squirrel 37

T.

- Tamias dorsalis 37
- Taxidea berlandieri 21
- Texas fox squirrel 34
  - possum 32
  - skunk 19
- Thomomys fulvus 41
  - umbrinus 41

Page.
Tiger 6
Tiger cat 8
Tutinquille 7

U.

Ursus amblyceps 29
    cinnamoneus 29
    horriaeus 24
    horribilis 24

Page

V.

Vespertilio pallidus 4
Virginia deer 50
Vulpes virginianus 16

W.

White-backed skunk 19
    bellied rat 42
Wild cat 13

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1—*Vespertilio pallidus*, Lec.—1045.—San Elizario, Texas.
1. *a*—side view of the head.

Fig. 2—*Macrotus californicus*, Baird.—Fort Yuma.
2. *a*—side view of the head; 2. *b*—back view of do., showing the membrane connecting the ears.

PLATE II.

Fig. 1—*Felis eyra*, Desm.—Matamoras.—Reduced from a drawing by Dr. Berlandier.

Fig. 2—*Putorius frenatus*, Aud. Bach.—Matamoras.—Young animal, before shedding its milk teeth. From an alcoholic specimen.
2. *a*—side view of the head; 2. *b*—roof of the mouth, showing the ridges of the palate; 2. *c*—under view of the fore foot; 2. *d*—under view of the hind foot, showing the naked turbercles.

PLATE III.

Fig. 1—*Didelphys californica*, Bennett.—Fig. 1, adult, No. 138.—Fig. 2, young, No. 199.

PLATE IV.

Sciurus limitis, Baird.—Devil's river, Texas.

PLATE V.

Sciurus castanonotus, Baird.—Copper Mines.

PLATE VI.

Fig. 1—*Tamias dorsalis*, Baird.—Copper Mines.
1. *a*—hairs of the tail separate, to show the annulation.

Fig. 2—*Sigmodon berlandieri*, Baird.—Adult.—Rio Nasas, Coahuila, Mexico.

PLATE VII.

Spermophilus grammurus, Bach.—(perhaps *S. macrurus.*)—Details from a specimen in alcohol, No. 1046.—Los Nogales.

1. *a*—view of head from the front ; 1. *b*—do. from the side ; 1. *c*—do. from beneath ; 1. *d*—under view of fore foot ; 1. *e*—do. of hind foot.

Fig. 2—*Spermophilus tereticauda*, Baird.—No. 1584.—Fort Yuma.

2. *a*—head from the side ; 2. *b*—do. from before ; 2. *c*—under view of fore foot ; 2. *d*—do. of hind foot.

Fig. 3—*Spermophilus spilosoma*, Bennett.—No. 1042.—Janos.

3. *a*—head from the side ; 3. *b*—do. from before ; 3. *c*—do. from beneath ; 3. *d*—under view of fore foot ; 3. *e*—do. of hind foot.

Fig. 4—*Reithrodon.*—Janos to San Luis Spring, New Mexico.

4. *a*—ear ; 4. *b*—under surface of fore foot ; 4. *c*—do. of hind foot ; the last two magnified three diameters.

PLATE VIII.

Thomomys umbrinus, Baird.—No. 154.—Copper Mines.

a—under surface of left fore foot ; *b*—its longest claw from the side ; *c*—do. from below ; *d*—under surface of hind foot.

PLATE IX.

Fig. 1—*Geomys clarkii,* Baird.—No. 6.—Presidio del Norte.

1. *a*—under surface of left fore foot ; 1. *b*—side view of its longest claw ; 1. *c*—under view of do. ; 1. *d*—under surface of left hind foot.

Fig. 2—*Perognathus hispidus*, Baird.—No. 577.. Charco Escondido, Mex.—From alcohol.

Fig. 3—*Dipodomys ordii*, Woodhouse.—Coahuila.—From alcohol.

PLATE X.

Fig. 1—*Thomomys umbrinus* Baird ?—No. 1036.—Espia.

1. *a*—side view of head ; 1. *b*—under view of do., showing the openings of the pouches ; 1. *c*—under surface of the fore foot, (the metacarpal portion much foreshortened ;) 1. *d*—do. hind foot.

Fig. 2—*Sigmodon berlandieri*, Baird.—No. 1034.—Los Nogales.

2. *a*—side view of head, showing the ear ; 2. *b*—under view of the muzzle ; 2. *c*—under view of the left fore foot ; 2. *d*—side view of its longest claw ; 2. *e*—under view of left hind foot ; *f*—side view of the longest claw.

N. B. The engraver has neglected to represent the hairs under the nostrils.

Fig. 3—*Neotoma mexicana*, Baird.—No. 1033.—San Pedro, Sonora.

3. *a*—side view of the head ; 3. *b*—muzzle from beneath ; 3. *c*—under surface of left fore foot ; 3. *d*—its longest toe and claw ; 3. *e*—under surface of hind foot ; 3. *f*—its longest toe and claw.

Fig. 4—*Perognathus flavus*, Baird.—No. 1043.—San Antonio to El Paso.

4. *a*—side view of head; 4. *b*—under view of do., showing the cheek pouches; 4. *c*—under view of left fore foot; 4. *d*—do. of hind foot; (the feet magnified three times.)

Fig. 5—*Perognathus flavus*, Baird.—No. 1041.—Los Nogales.

The references the same as in fig. 4; the feet also magnified three diameters.

NOTE.—In this figure the posterior plantar tubercle has been omitted by the engraver; as also the furrows in the anterior faces of the upper incisors, both here and in figure 4.

Fig. 6—*Reithrodon* ——— ?—No. 1039.—Janos to San Luis Spring.

6. *a*—side of head; 6. *b*—under surface of left fore foot; 6. *c*—do. of left hind foot. The feet magnified three diameters.

PLATE XI.

Fig. 1—*Felis concolor*, Linn.—No. 1148.—Eagle Pass, Texas.—Adult; about two-thirds the natural size.

a—skull from below; *b*—do. from above; *c*—do. from the side; *d*—left side of lower jaw; *e*—do. from above.

Fig 2—*Felis concolor*—No. 1110.—Copper Mines.—Young, still having the milk teeth; skull natural size.

a—side view of left upper teeth; *b*—right upper teeth from below; *c*—left side of lower jaw.

PLATE XII.

Felis pardalis, Linn.—No. 1359.—Matamoras, Mex.—Adult; skull natural size. References *a–e*, as in Plate XI, fig. 1.

PLATE XIII.

Fig. 1—*Felis pardalis*, Linn.—No. 1360.—Matamoras.—Young, with temporary teeth; skull natural size. References *a–e*, as in fig. 1, Plate XI.

Fig. 2—*Felis eyra*, Desm.—No. 1373.—Matamoras, Mex.—Adult; skull natural size. References *a–e*, as in the last.

PLATE XIV.

Fig. 1—*Felis yaguarundi*, Desm.—No. 1426.—Matamoras.—Adult; skull natural size. References *a–e*, as usual.

Fig. 2—*Bassaris astuta*, Licht.—No. 1619.—El Paso, Texas.—Adult female; skull natural size. References *a–e*, as usual.

PLATE XV.

Fig. 1—*Lynx maculatus ?*—No. 1370.—Matamoras.—Quite young, with the permanent teeth, however; skull natural size. References *a–e*.

Fig. 2—*Lynx maculatus?*—No. 1371.—Matamoras.—Skull, with the temporary teeth, natural size. References *a–e*.

PLATE XVI.

Canis latrans, Say.—No. 999.—Copper Mines, New Mexico.—Skull reduced to about two-thirds natural size. References *a–e*.

PLATE XVII.

Fig. 1—*Putorius frenatus,* Aud. & Bach.—No. 1172.—Lower Rio Grande.—Skull of adult, natural size. References *a–e*.

Fig. 2—*Putorius frenatus*, Aud. & Bach.—No. 1725.—Matamoras.—Skull of young, with the temporary teeth; natural size. References *a–e*.

Fig. 3—*Mephitis bicolor*, Gray.—No. 1621.—Indianola, Texas.—Adult; skull natural size. References *a–e*.

PLATE XVIII.

Procyon hernandezii, Wiegm.—No. 1386.—Matamoras, Mexico.—Adult; skull natural size. References *a–e*.

PLATE XIX.

Ursus cinnamomeus?—No. 992.—Copper Mines.—Adult skull. Reduced to less than two-thirds. References *a–e*.

PLATE XX.

Ursus horribilis, var. *horreaeus*, Baird.—No. 995.—Copper Mines.—Young skull, with the permanent teeth; *a–e*, as in the preceding plates; all reduced to one-third the natural size; *f*—left upper teeth from the outside; *g*—do. from below; *h*—left lower from the outside; *i*—do. from above; *f–i*, natural size.

PLATE XXI.

Fig. 1—*Sciurus limitis*, Baird.—No. 1265.—Devil's river, Texas.—Skull natural size. References *a—e*.

Fig. 2—*Sciurus castanonotus*, Baird.—No. 1107.—Copper Mines, New Mexico.—Skull natural size. References *a–e*.

Fig. 3—*Spermophilus couchii*, Baird.—No. 1255.—Santa Catarina, Mexico.—Skull. References *a–e*, natural size; *f*—left upper molars from below; *g*—left lower molar from above; *f* and *g* about one-half greater than natural size.

Fig. 4—*Spermophilus tereticauda*, Baird.—No. 2419.—Fort Yuma, Cal.—Skull. References as in preceding figure, (*a–g*,) *f* and *g* nearly twice natural size.

PLATE XXII.

Fig. 1—*Spermophilus grammurus*, Bach.—No. 1111.—Copper Mines, New Mexico.—Skull natural size. References *a–e*.

Fig. 2—*Spermophilus mexicanus*, Licht.—No. 1267.—Brownsville, Texas.—Skull natural size. References *a–e*.

Fig. 3—*Spermophilus spilosoma*, Bennet.—No. 1323.—El Paso.—Skull.—*a–e*, natural size; *f*—left upper molars from below; *g*—left lower molars from above; *f–g*, rather more than twice natural size.

PLATE XXIII.

Fig. 1—*Geomys clarkii*, Baird.—No. 1624.—Presido del Norte. Skull.—*a–e*, natural size; *f*—left upper molars from below; *g*—left lower molars from above; *f–g* magnified nearly three times.

Fig. 2—*Dipodomys agilis*, Gambel.—No. 1630.—Monterey, Cal.—Skull. *a–e*, natural size; *f*—left upper molars from below; *g*—left lower molars from above; *h*—front view of upper incisors; *f–h*, magnified a little more than twice.

Fig. 3—*Dipodomys ordii*, Woodhouse.—No. 1632.—Western Texas.—Skull. References *a–h*, as in the last figure.

Fig. 4—*Dipodomys ordii*, var. *montanus*.—No. 1631.—Upper Rio Grande valley. *a*—left upper molars from below; *b*—left lower molars from above; *c*—front view of upper incisors. Magnified about twice.

Fig. 5—*Thomomys umbrinus*, Baird.—No. 1231.—Sonora.—Skull. References *a–g* as in fig. 1; *f* and *g* magnified nearly three times.

Fig. 6—*Perognathus hispidus*, Baird.—No. 1696.—Female.—Charco Escondido, Mexico.—Skull. References *a–g*, as in fig. 1; *f–g* magnified rather more than twice.

PLATE XXIV.

Fig. 1—*Neotoma mexicana*, Baird.—No. 260.—Colorado bottom.—Skull. *a*—from below; *b*—from above; *c*—from the side; *d*—left side of lower jaw; *e*—do. from above; all of natural size; *f*—left upper molars from below; *g*—left lower molars from above; *f* and *g* magnified nearly three times.

Fig. 2—*Neotoma micropus*, Baird.—No. 1676.—Male.—Charco Escondido, Mexico.—Skull. References *a–g*, as in the preceding figure; *f* and *g* magnified nearly three times.

Fig. 3—*Sigmodon berlandieri*, Baird.—No. 1667.—Coahuila, Mexico.—Skull. References *a–g*, as in figure 1; *f* and *g* magnified nearly three times.

Fig. 4—*Reithrodon megalotis*, Baird.—No. 2281.—Janos to San Luis Spring, New Mexico.—Skull. References *a–g*, as in fig. 1; *f–g* magnified nearly three times.

PLATE XXV.

Fig. 1—*Lepus callotis*, var. *flavogularis?*—No. 1215.—San Antonio to El Paso.—Skull natural size. References *a–e*.

Fig. 2—*Lepus artemisia*, Bach.—No. 1232.—San Antonio to El Paso.—Skull natural size. References *a–e*.

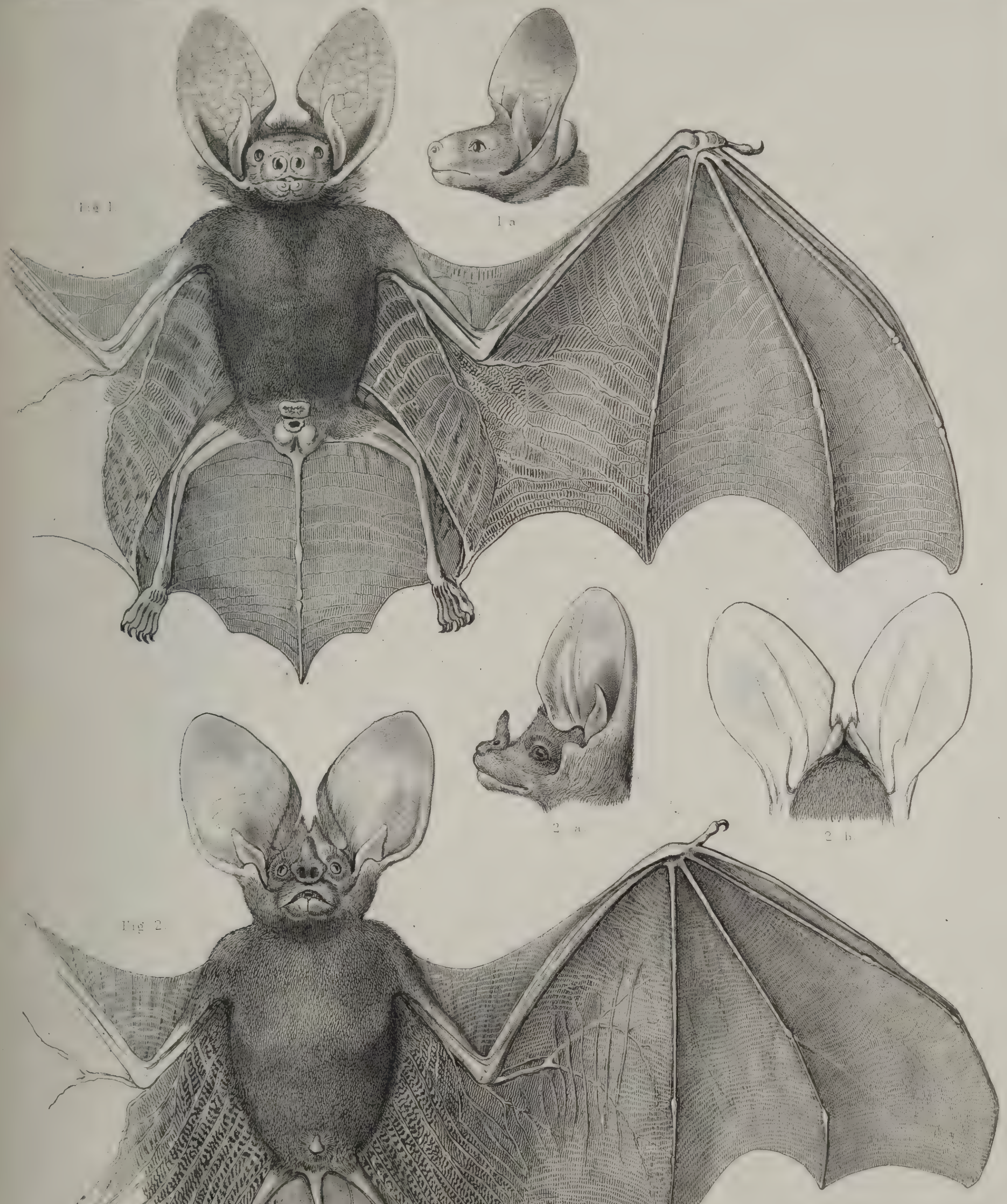
PLATE XXVI.

Dasypus novemcinctus, Linn.—No. 1409—Matamoras, Mexico.—Skull natural size. References *a–e*.

PLATE XXVII.

Fig. 1—*Dicotyles torquatus*, Cuv.—No. 1101.—Female.—Brownsville, Texas.—Skull; teeth partly worn. References *a–e*, half natural size; *f*—right upper molars from the side; *g*—left upper molar from below; *h*—left lower molar from the side; *i*—do. from above; *f–i* natural size.

Fig. 2—*Dicotyles torquatus*, Cuv.—No. 1008.—Rio Grande.—Teeth as of a younger animal, with the crowns unworn; *a*—left upper molars from the side; *b*—do. from below; *c*—left lower molars from the side; *d*—do. from above. All natural size.



J H Richard del

E Metzeroth s

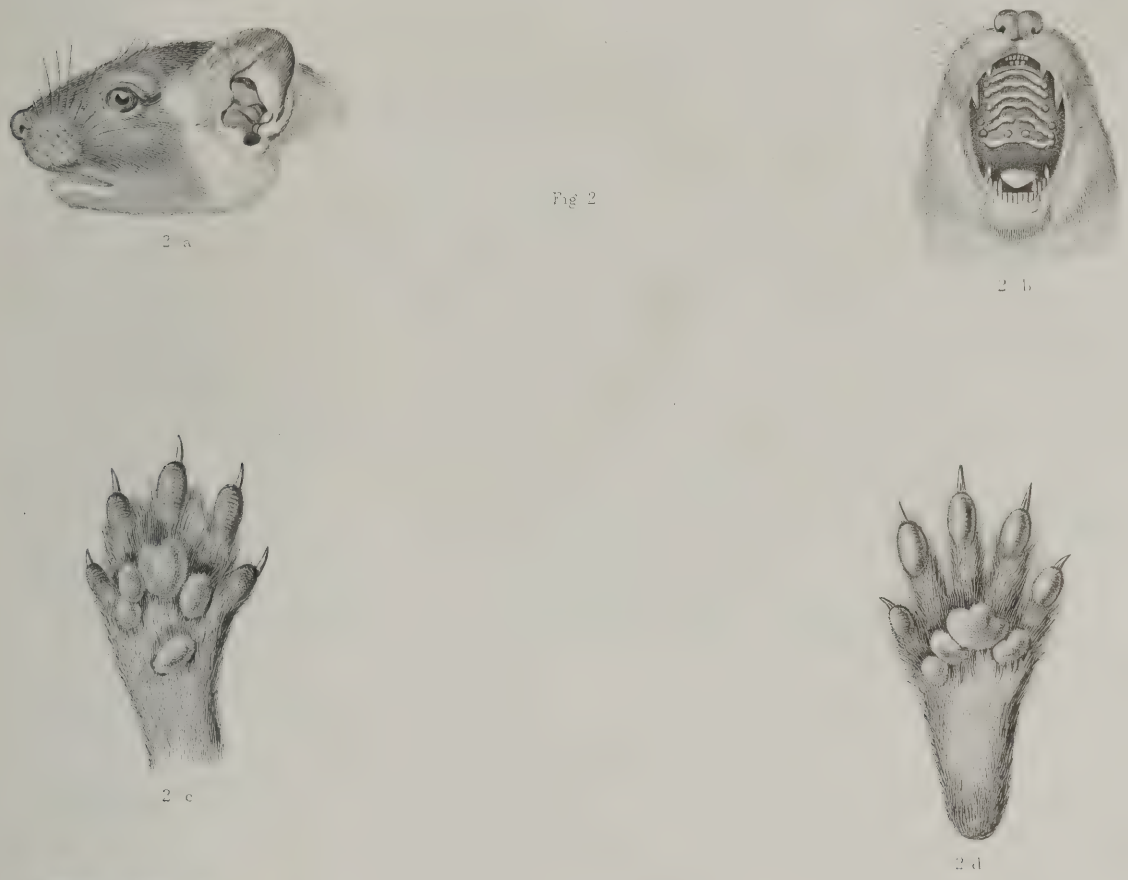


Fig 2

2 a

2 b

2 c

2 d

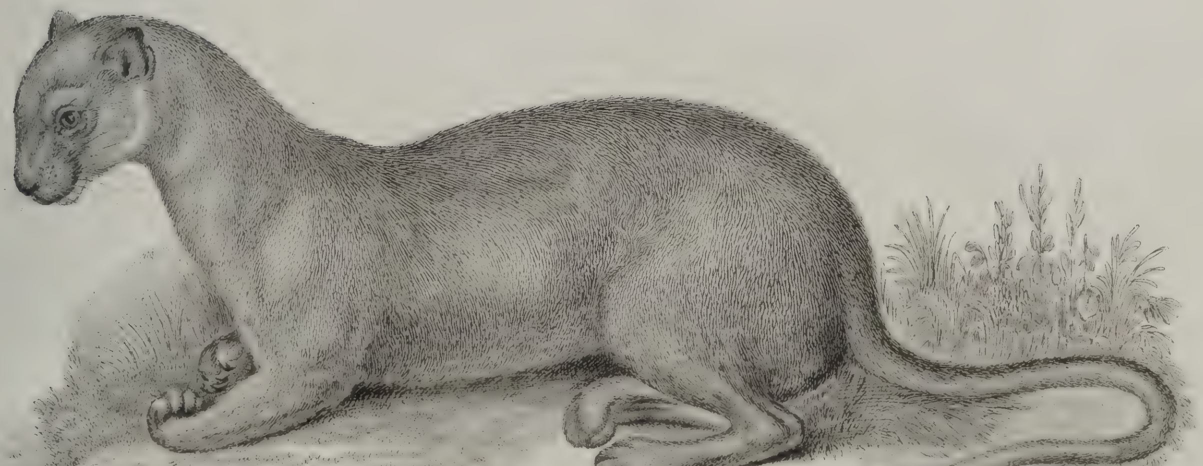


Fig 1

J. H. Richard del.

R. Metzerott sc.

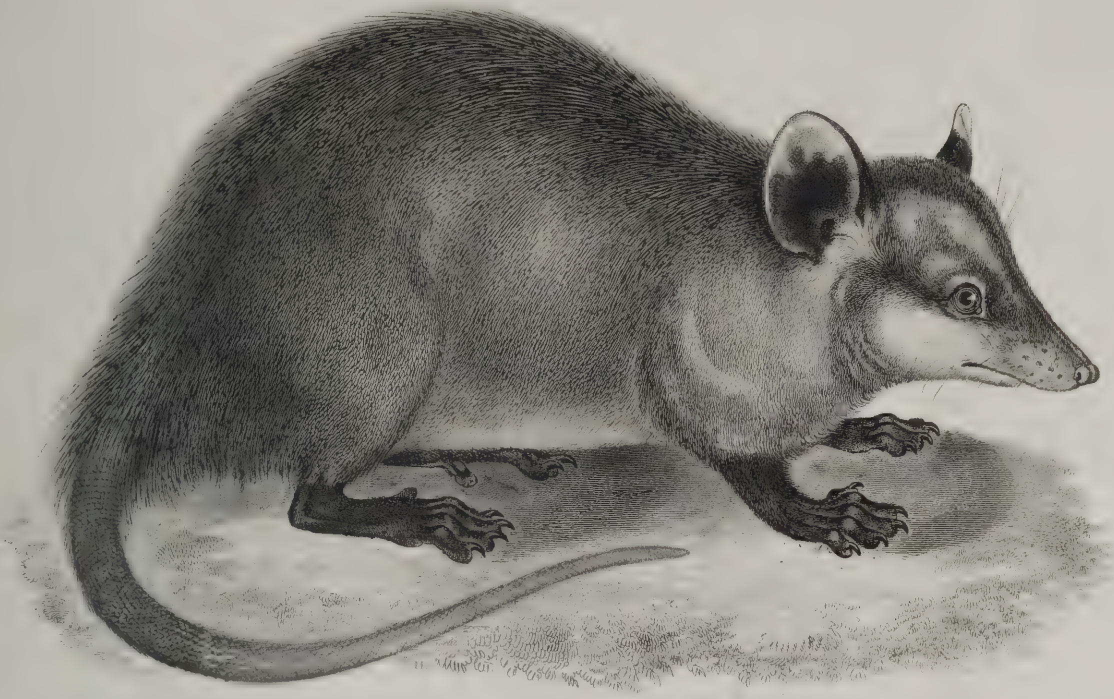
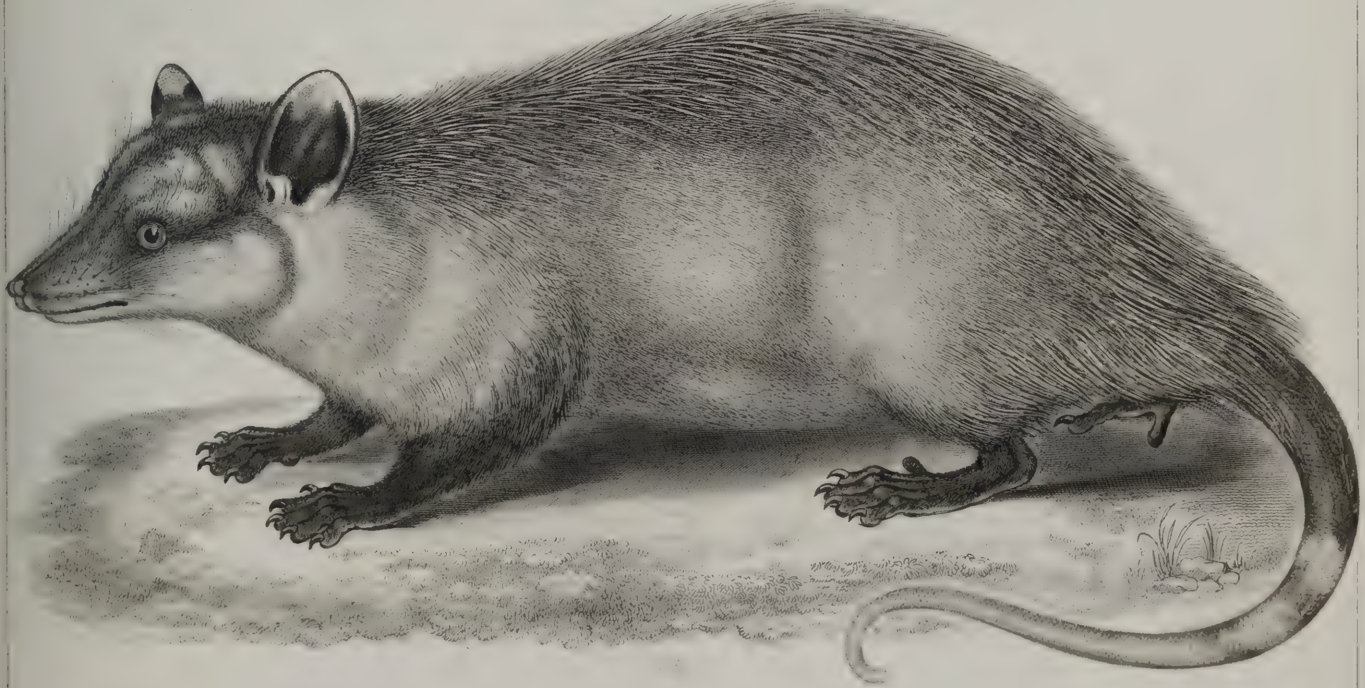
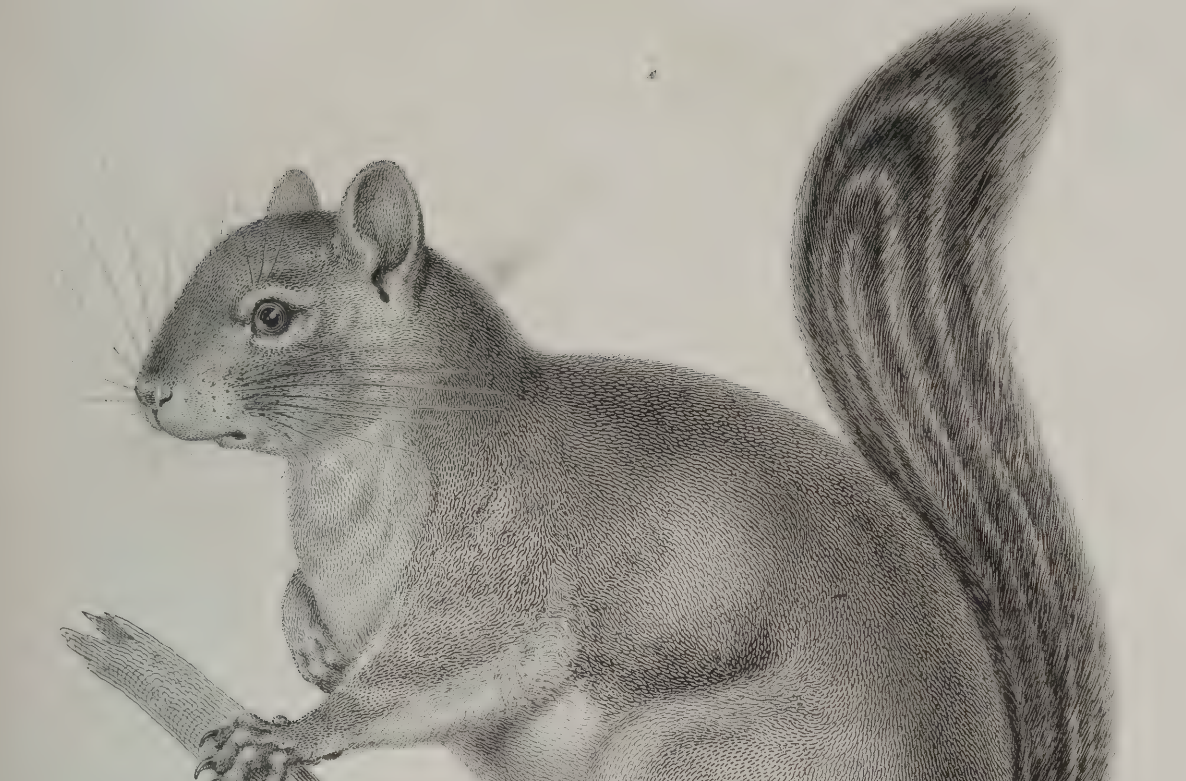


Fig. 2

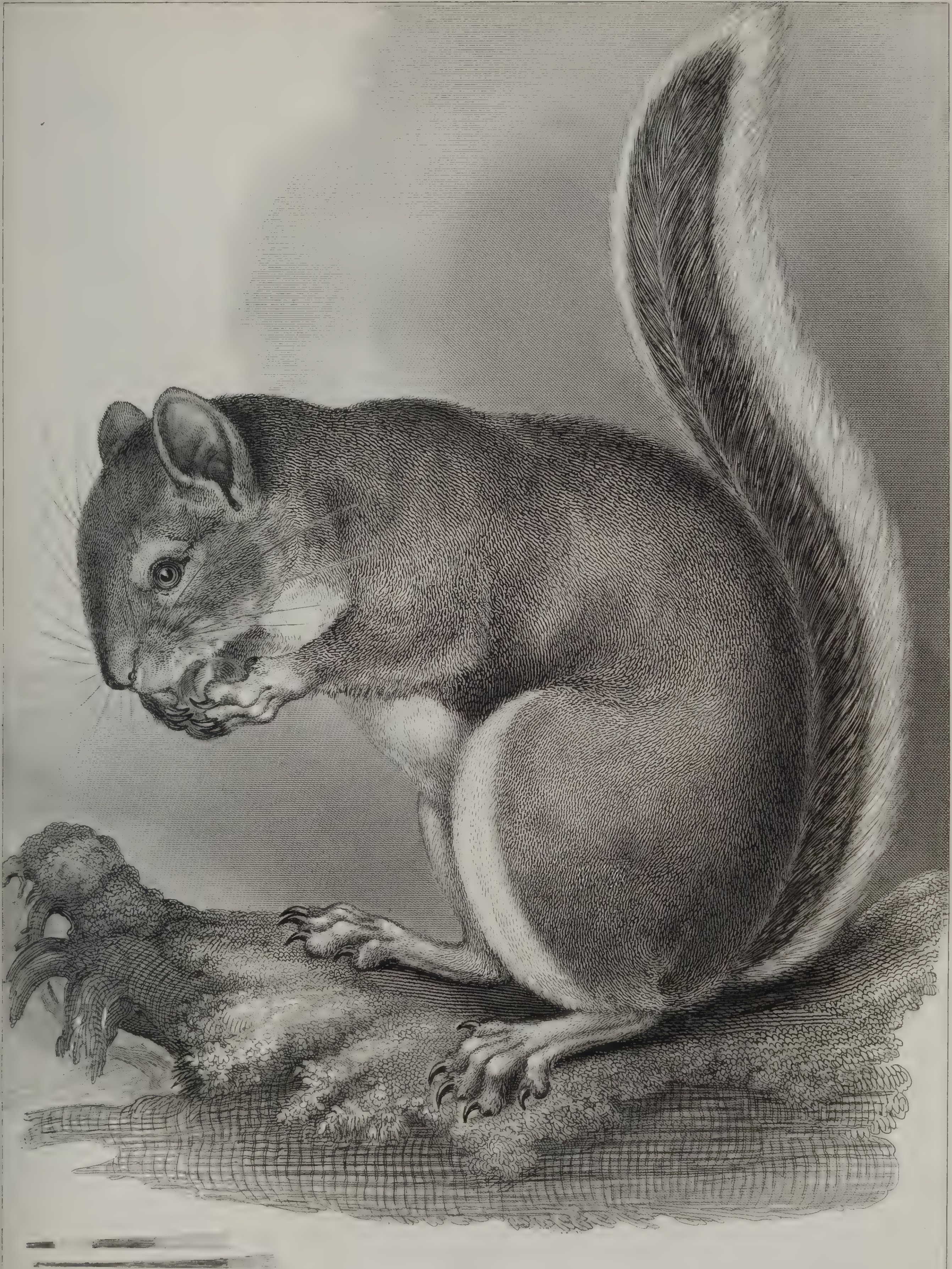


J. Metzeroth sc.



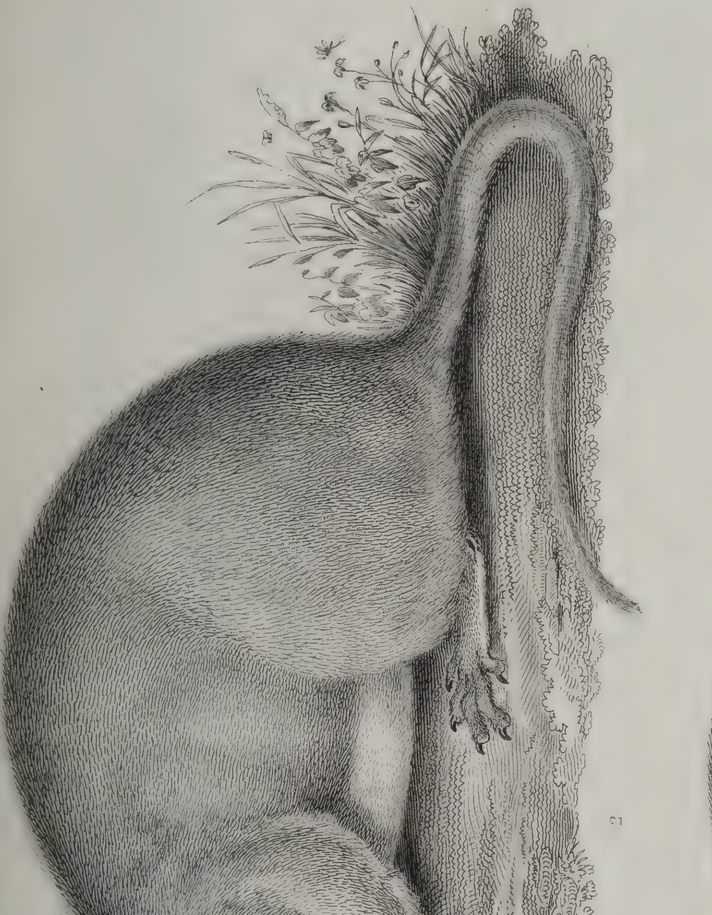
J. H. Richard del

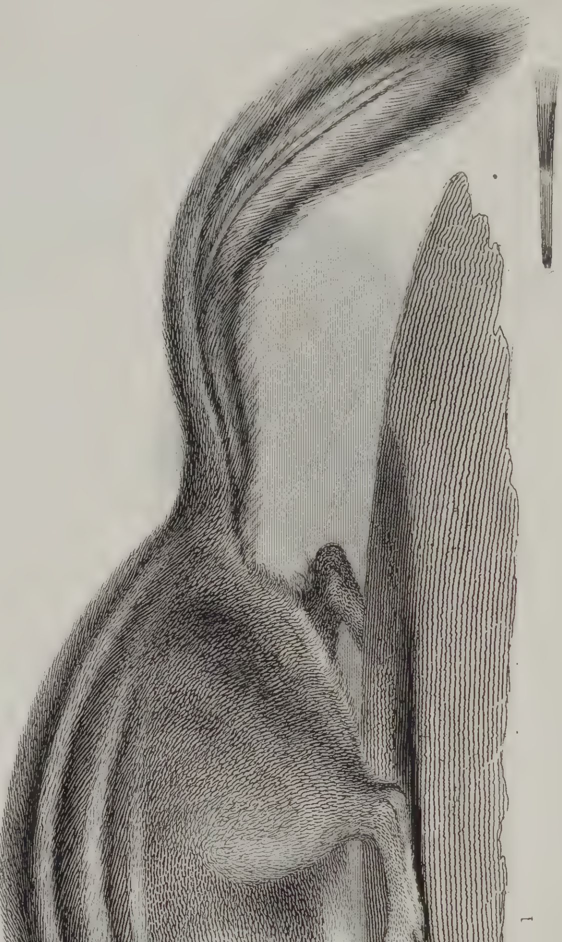
R. Metzerott sc



J. H. Richard del.

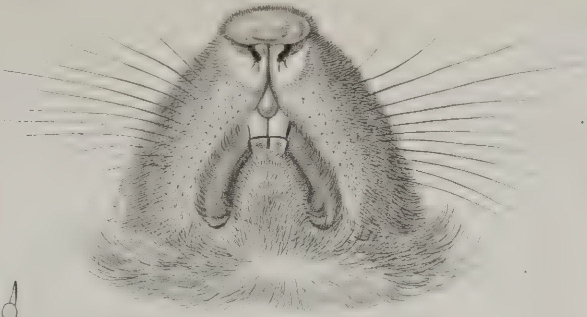
Metzeroth sc





J H Richard del

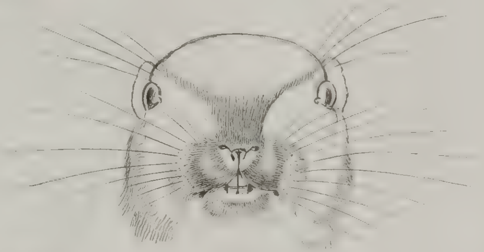
R Metzeroth sc.


1.c

3.c

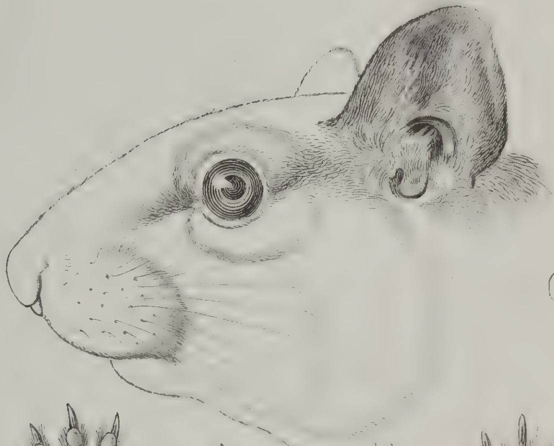
4.c

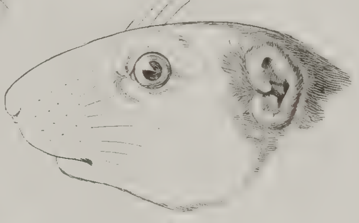
4.b

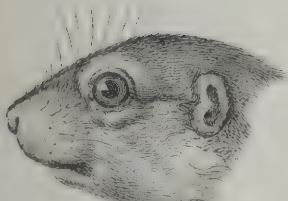

3.b

4.a

2.b

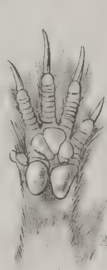

1.b


3.a

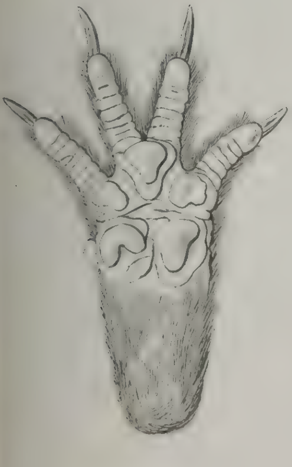

2.a

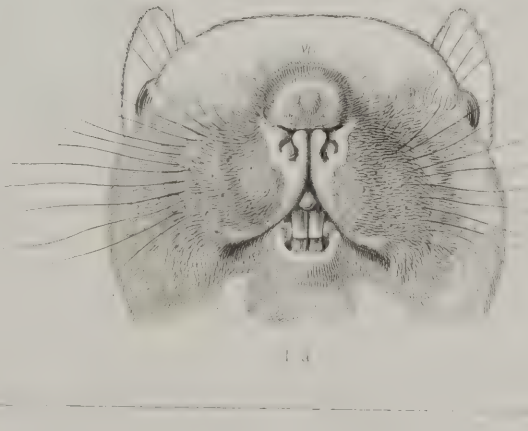
2.d

2.c


3.d

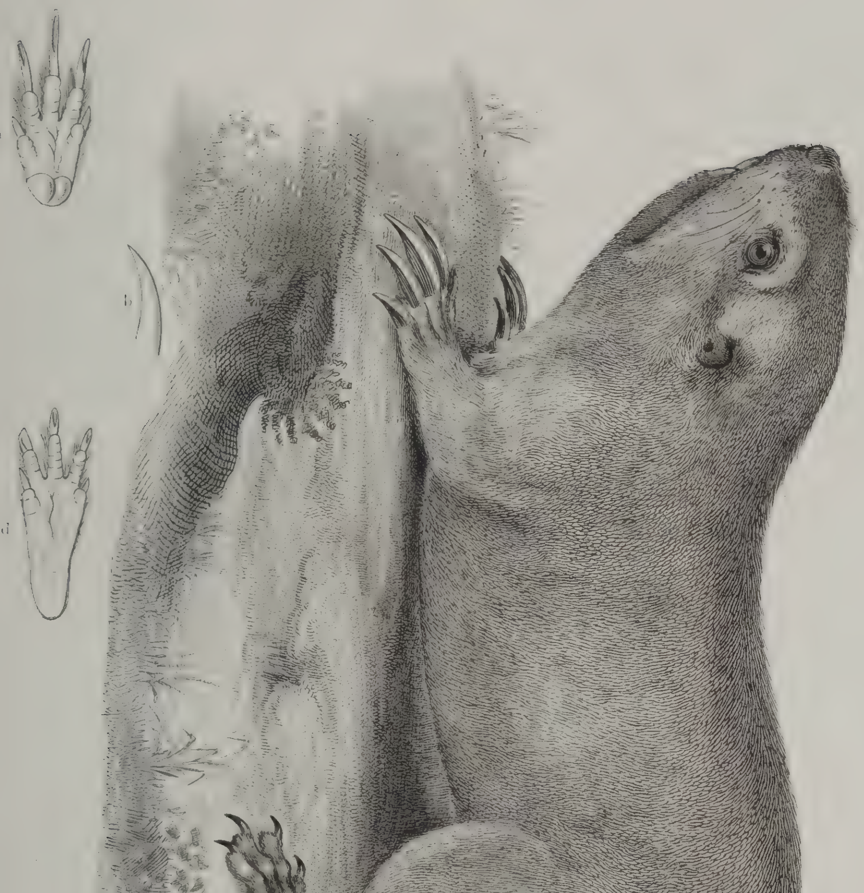
3.e




1.a

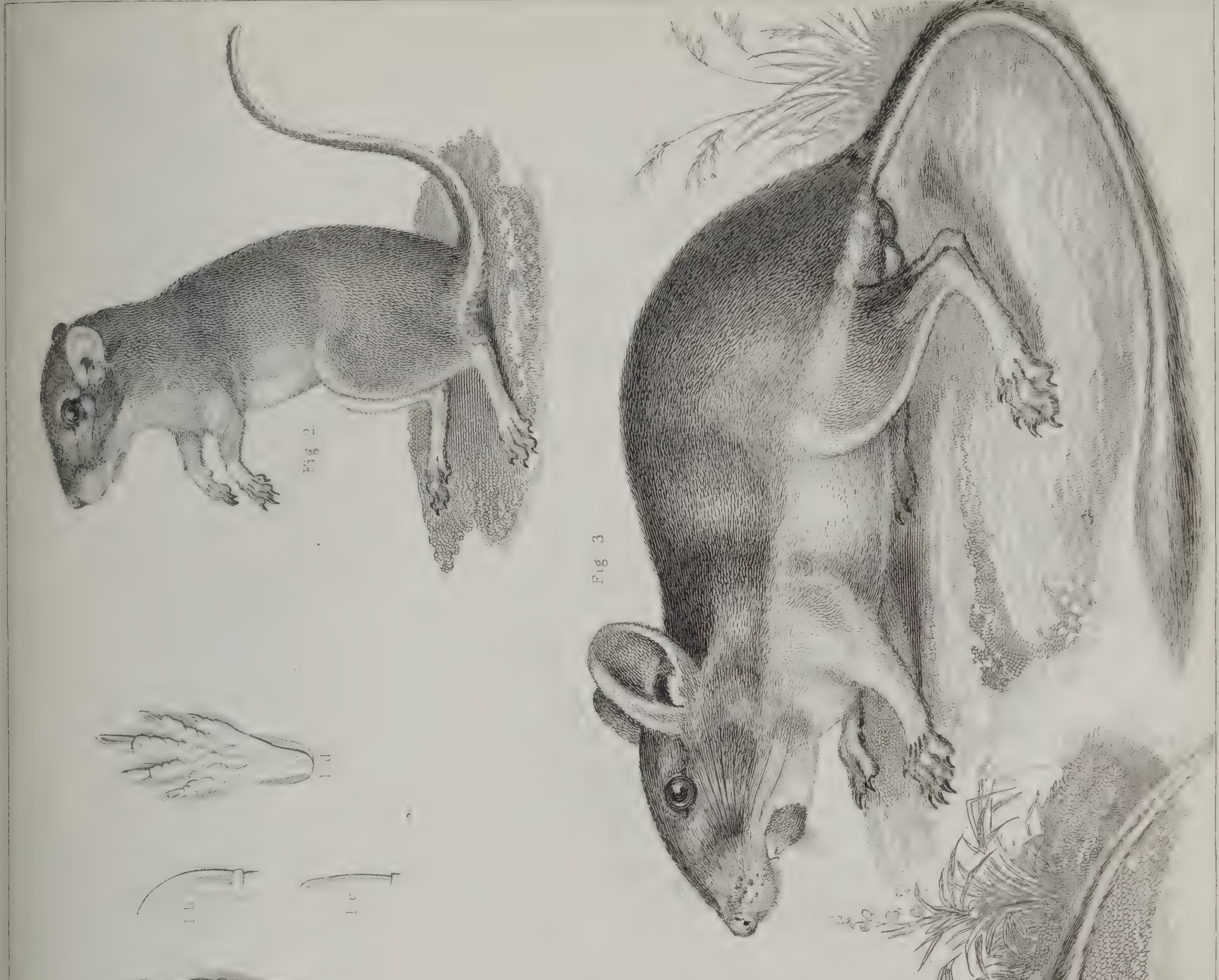
J. H. Richard del.

H. Metzeroth sc.



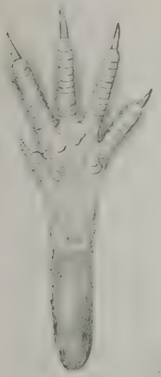
J. H. Richard del

Metzerott sc

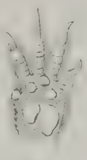


H.Richard del

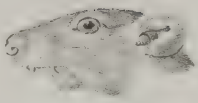
R. Metzerott sc



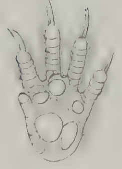
5. d



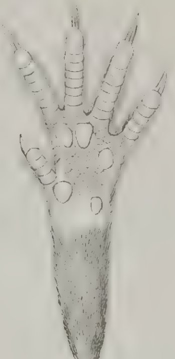
5. c



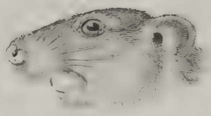
5. a



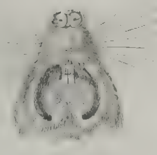
4. c



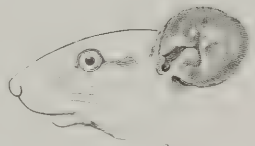
4. d



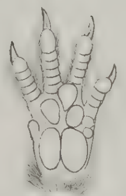
4. a



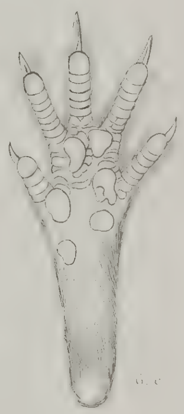
5. b



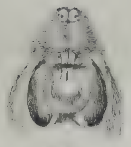
6. a



6. b



6. c

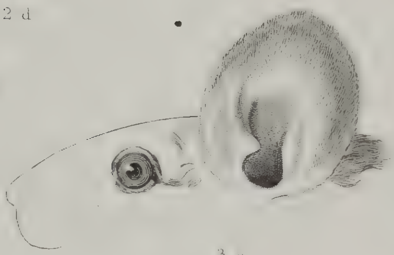


4. b

2. d

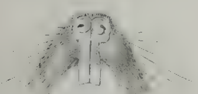
2. f

3. d

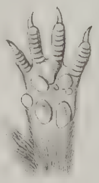


3. a

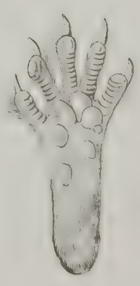
3. f



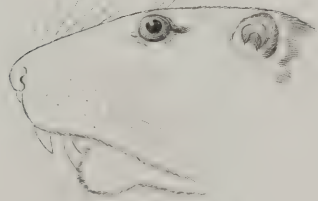
2. b



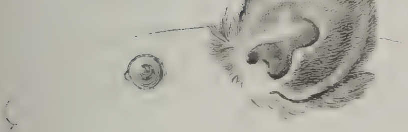
3. c



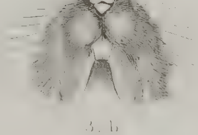
3. e



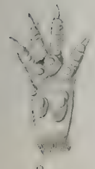
1. a



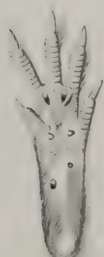
2. a



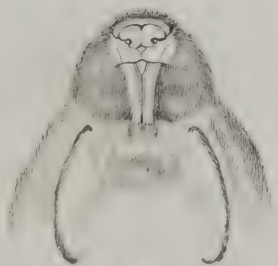
3. b



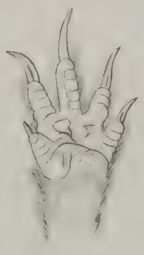
2. c



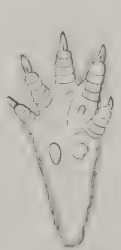
2. e



1. b



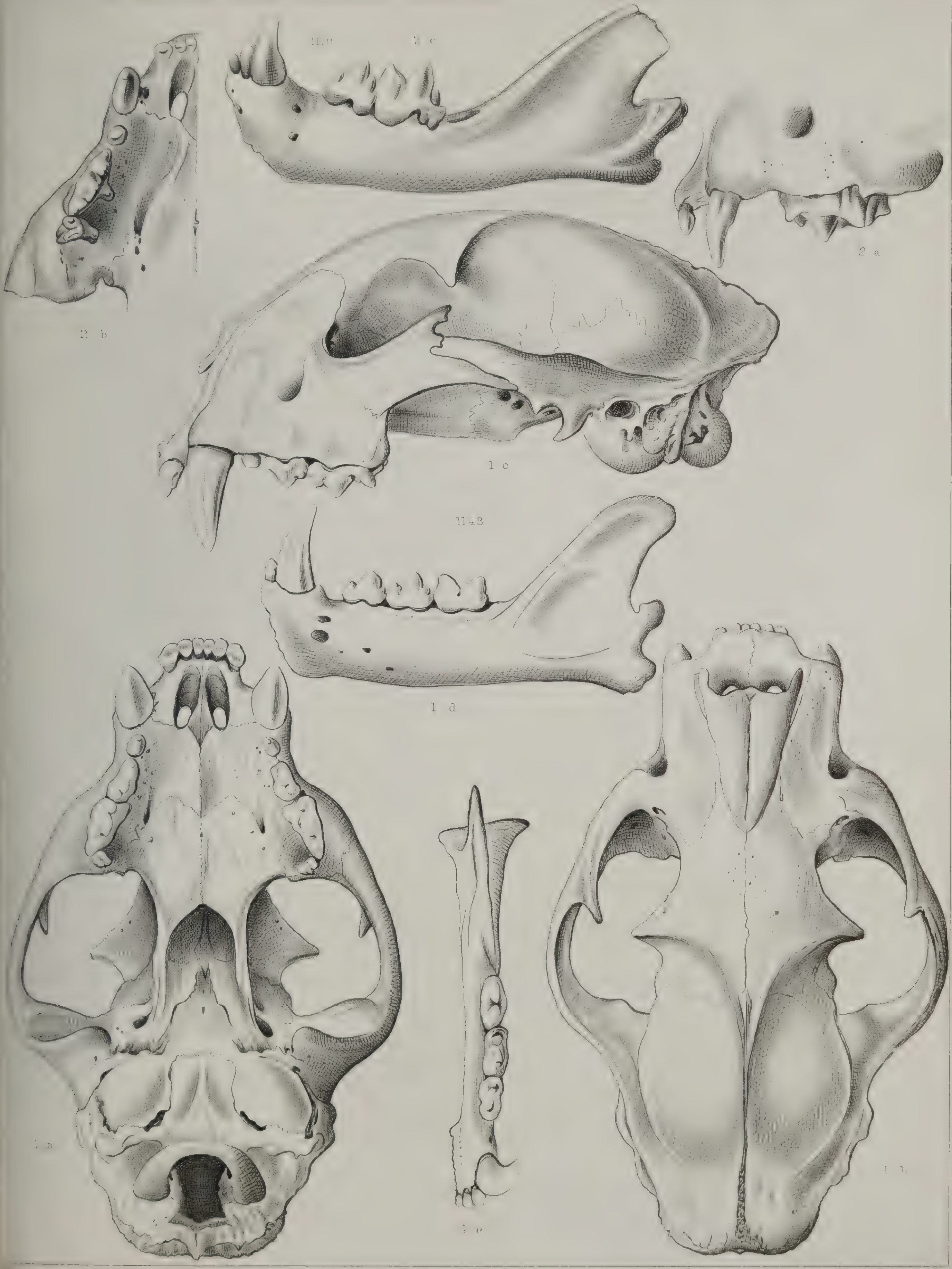
1. c



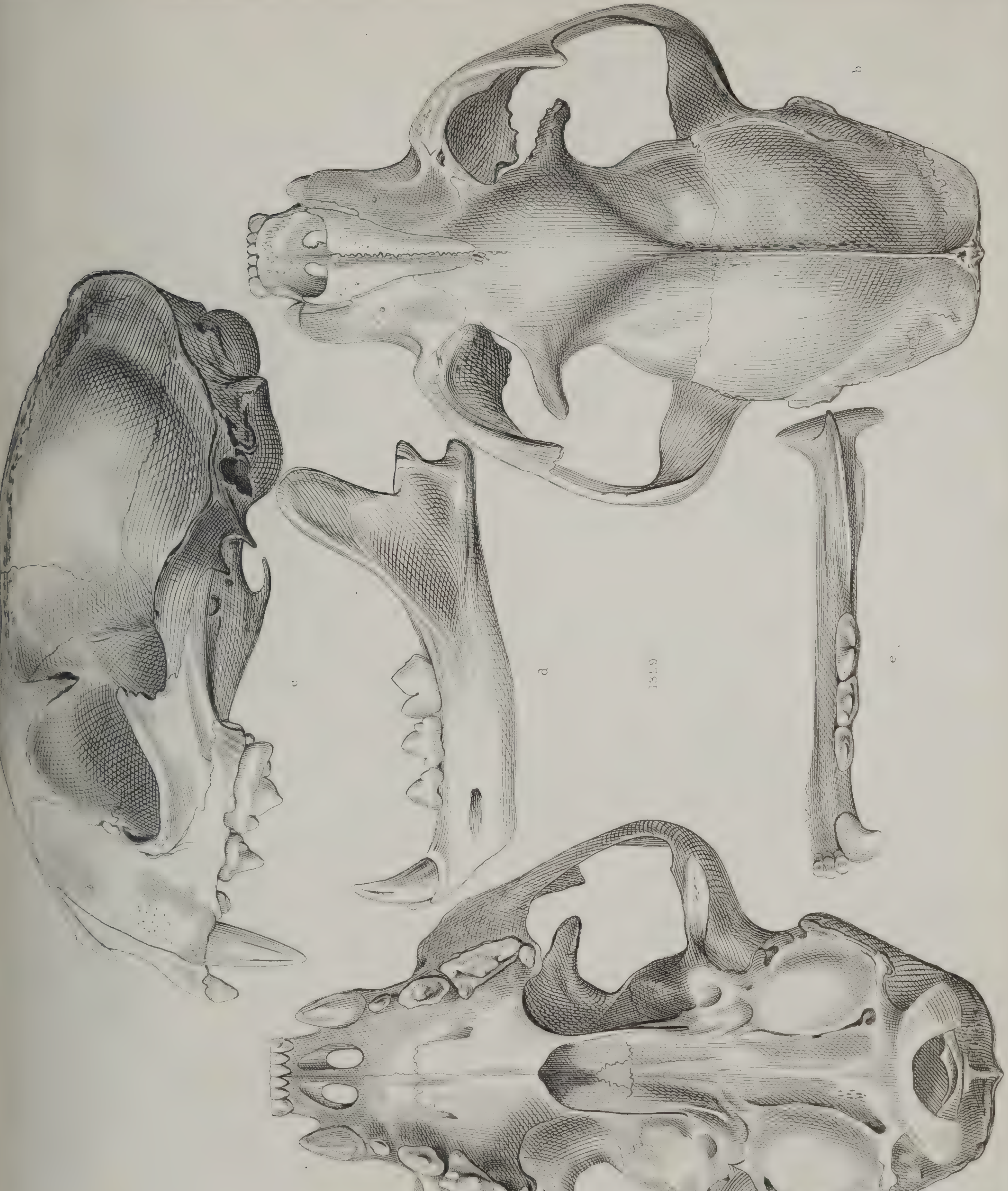
1. d

[illegible] Richard del.

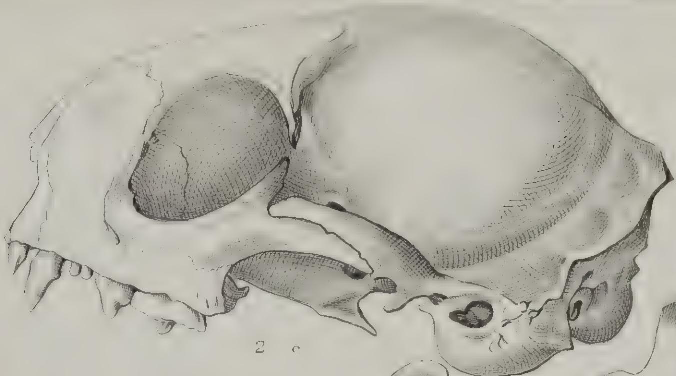
R. Metzerott sc.



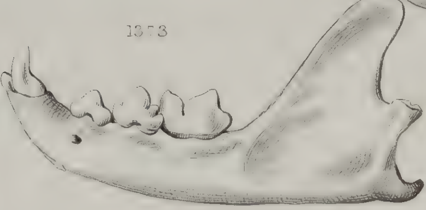
[illegible] del. Dougal sc.



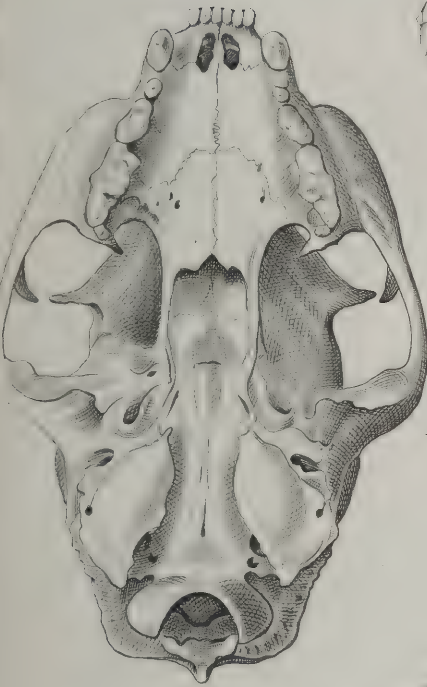
[illegible] del. Dougal sc.

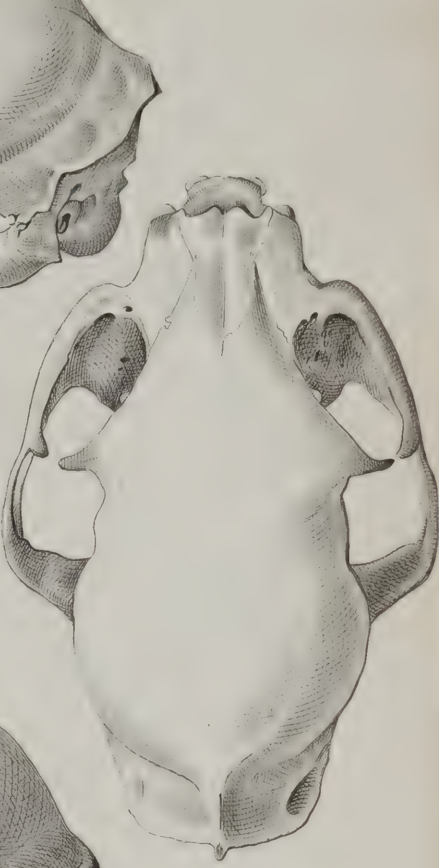

2 c

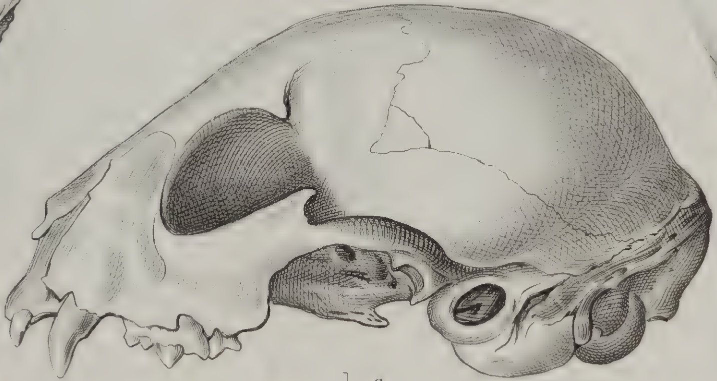
1373


2 d

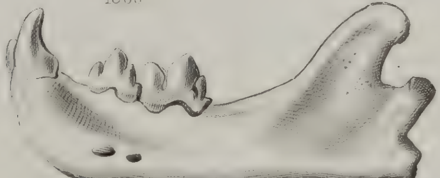
2 e


2 a

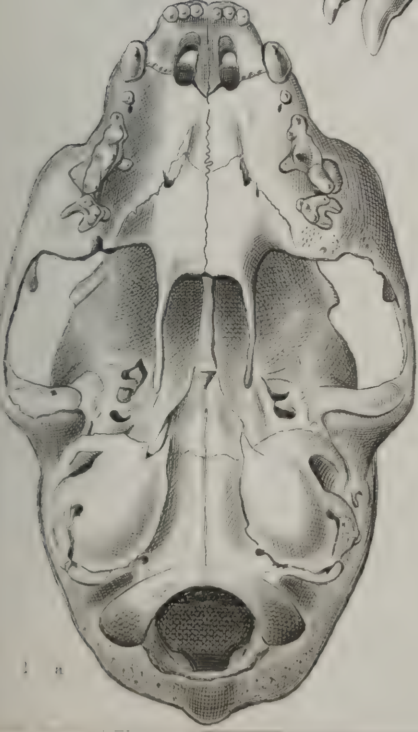

2 b

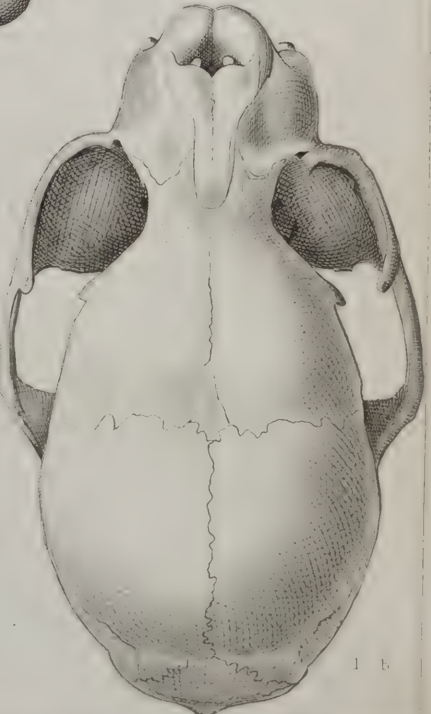

1 c

1360


1 d

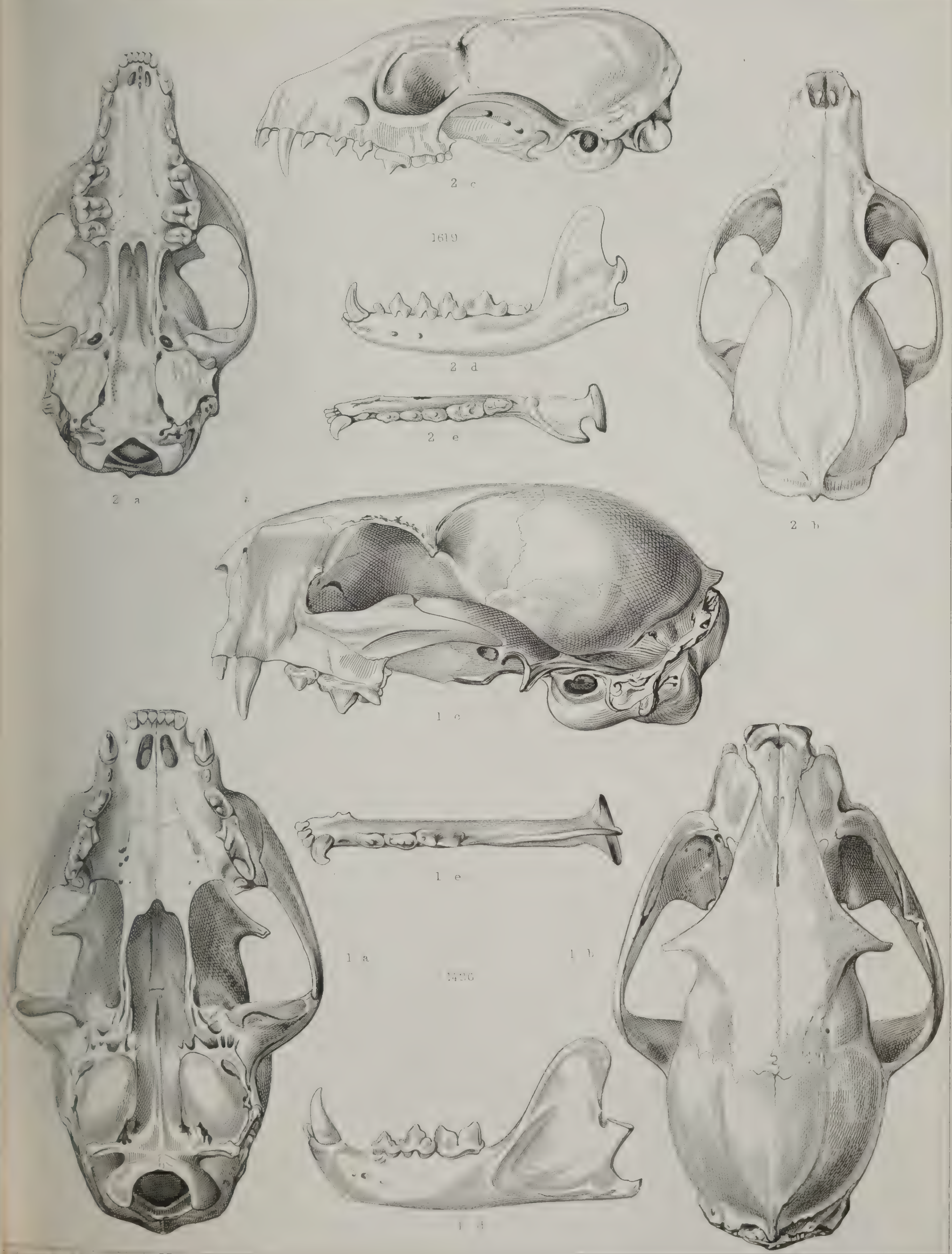
1 e


1 a

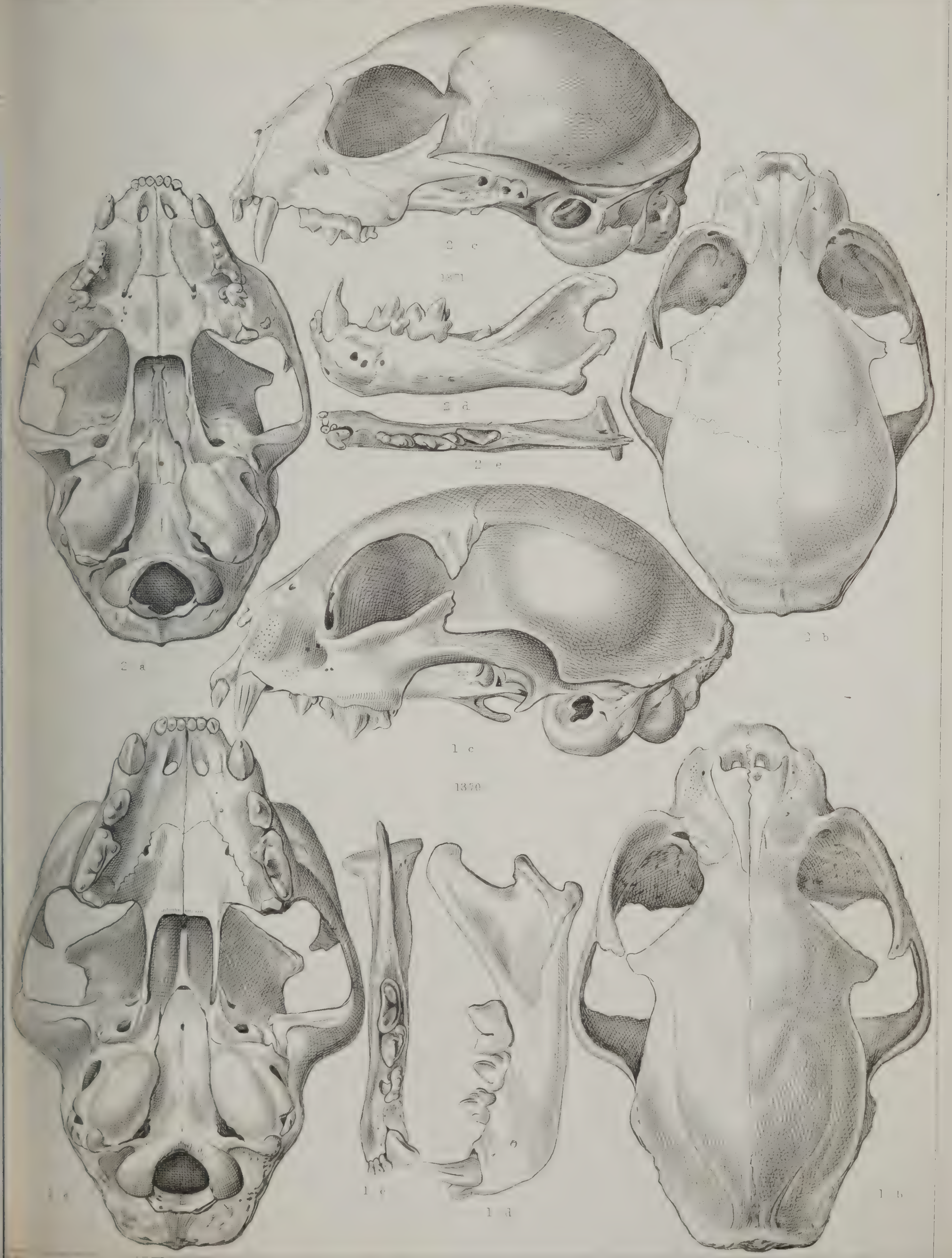

1 b

Richard. & Metzeroth del.

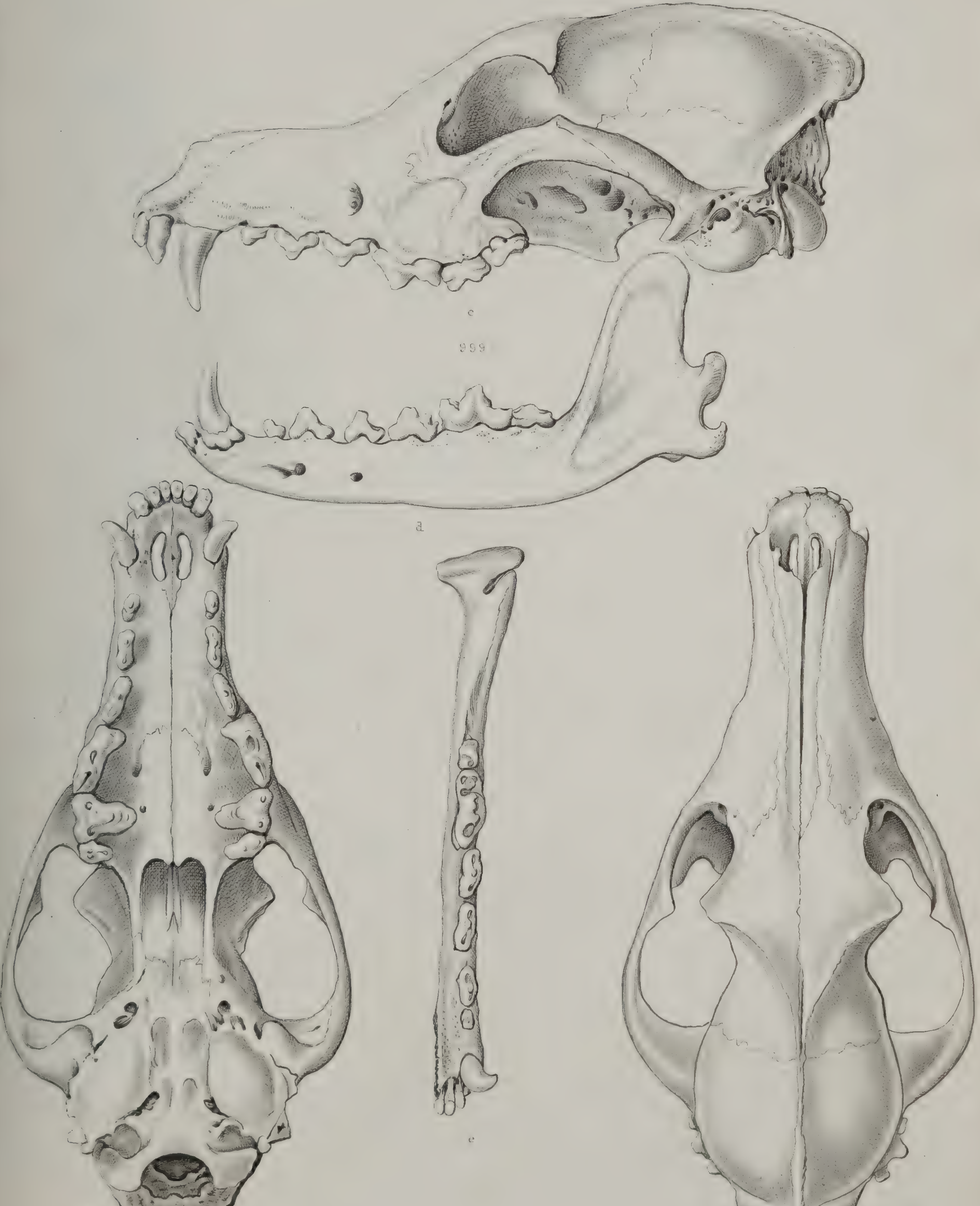
Dougal sc.



[illegible] del. Dougal sc.

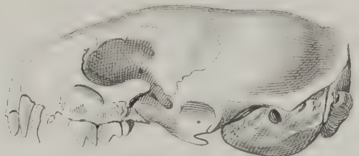


Dougal sc.

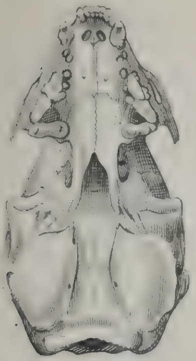


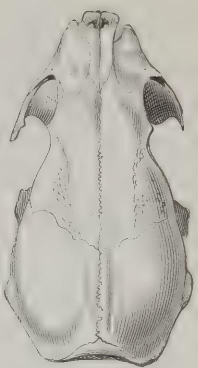
H. Richard del.

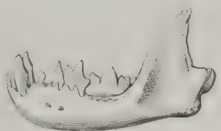
Dougal sc.

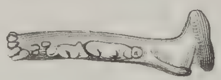

2 c

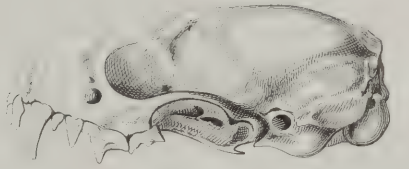
1723


2 a

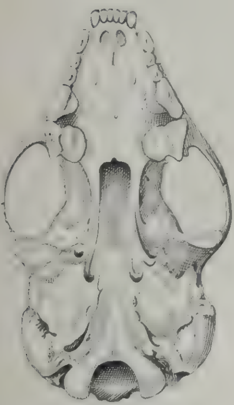

2 b

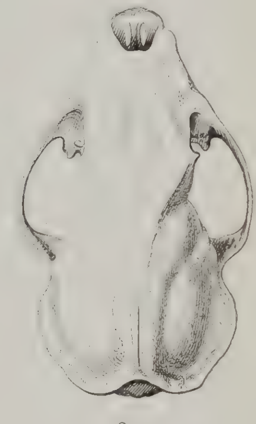

2 d

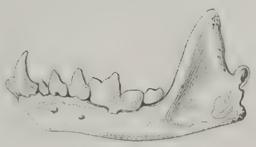

2 e

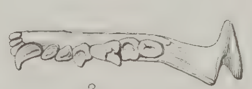

3 c

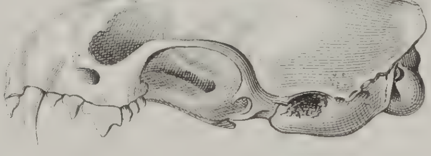
1621


3 a

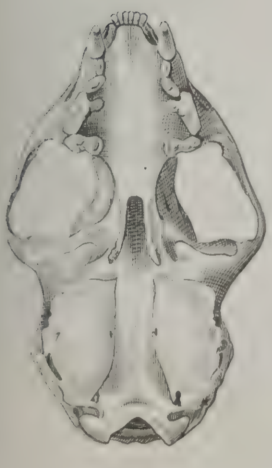

3 b

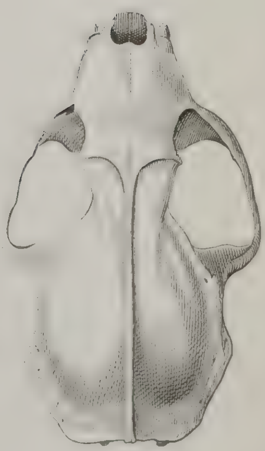

3 d

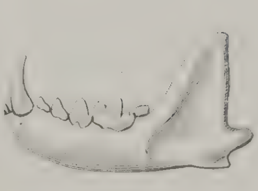

3 e

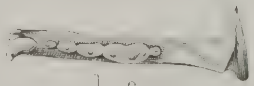

1 c

[illegible]

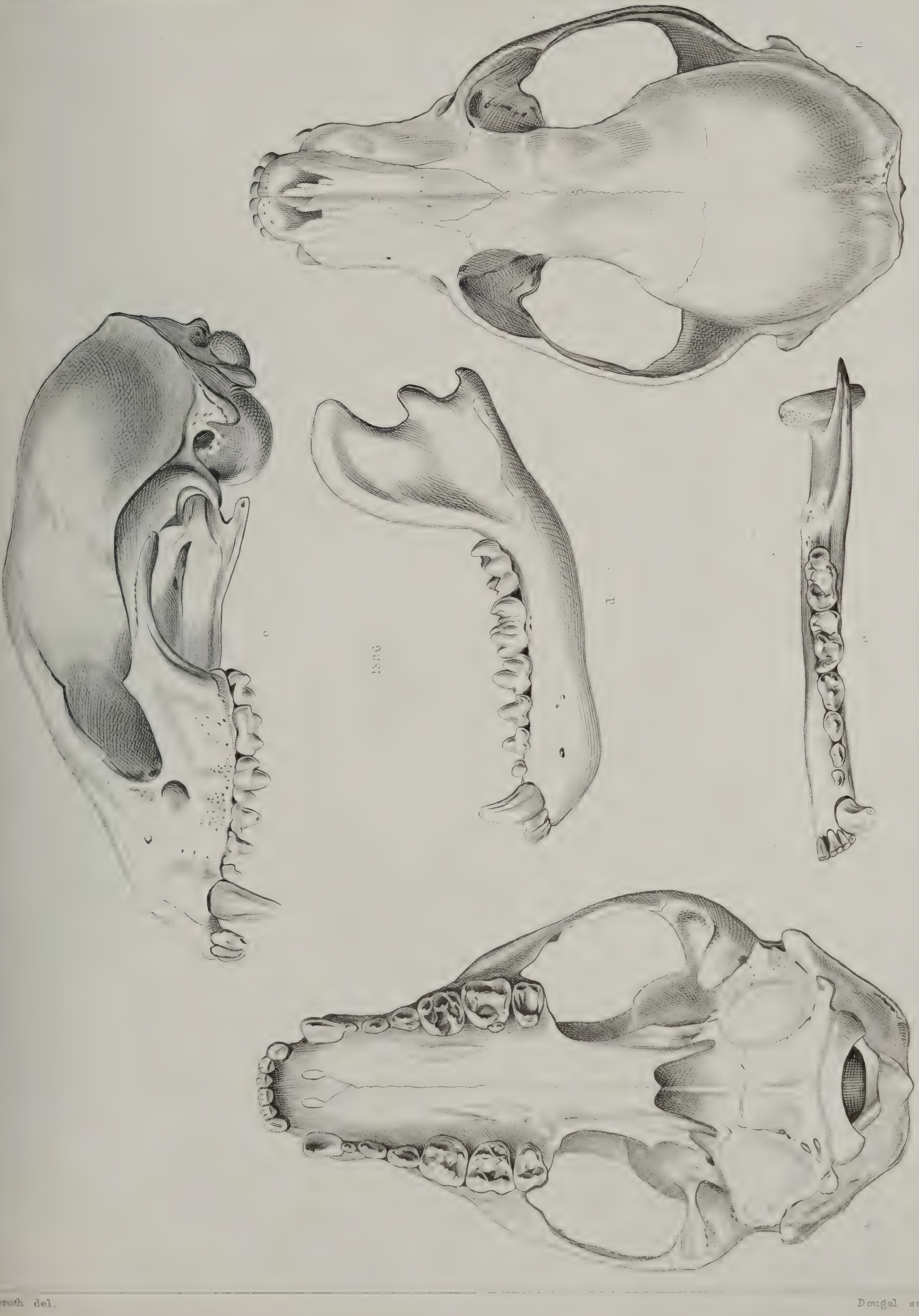

1 a


1 b

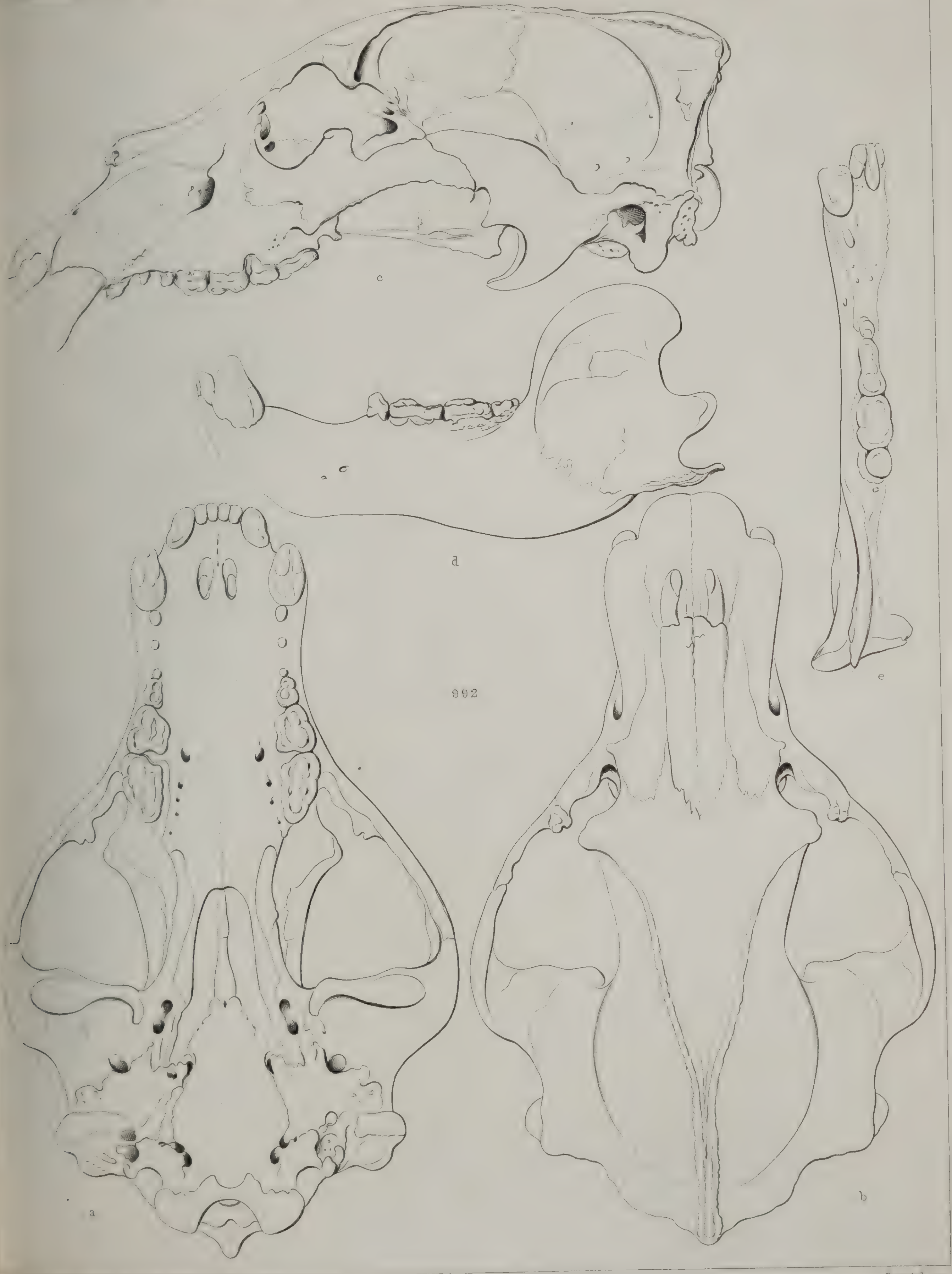

1 d


1 e

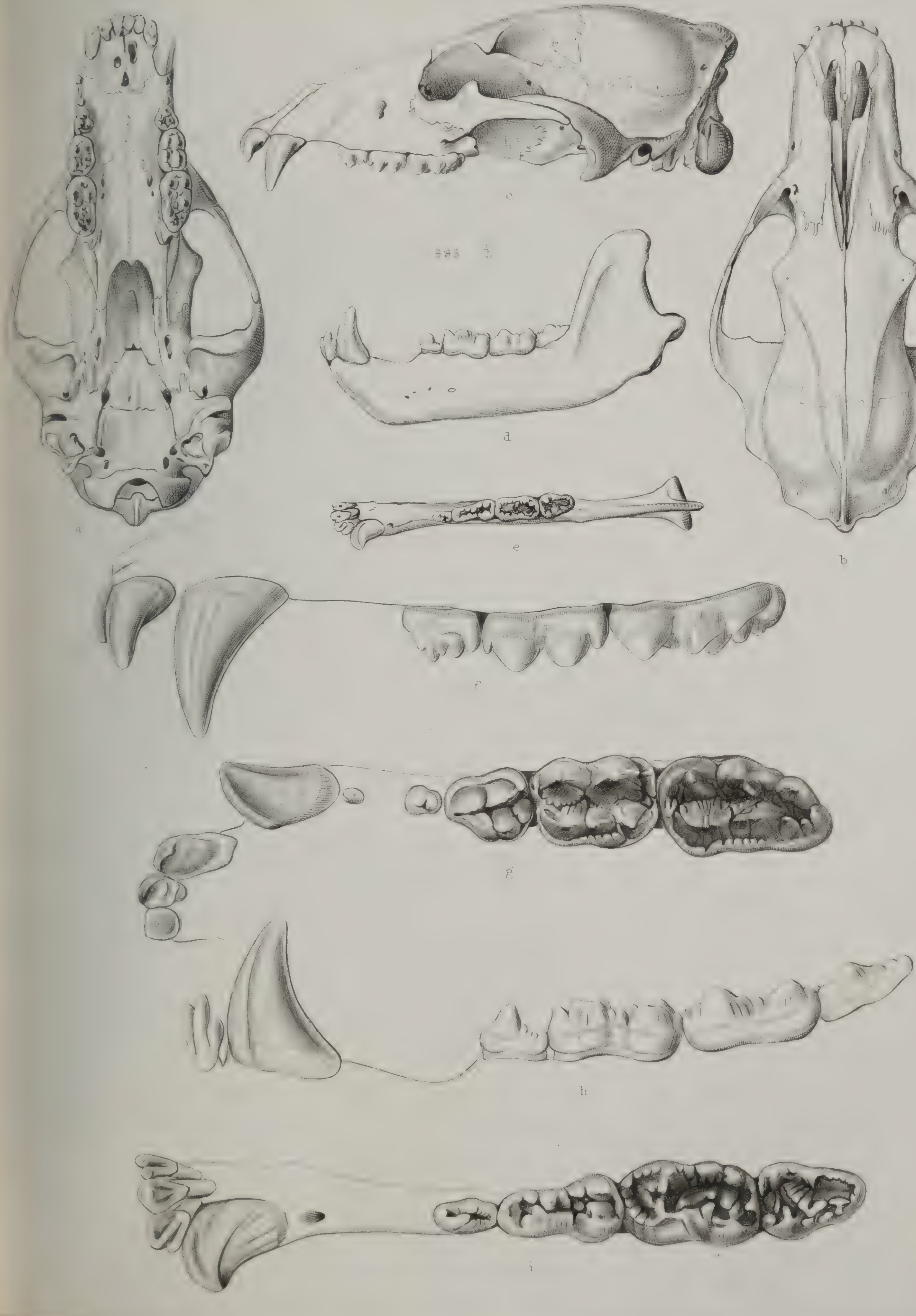
F. Metzeroth del. Dougal sc.



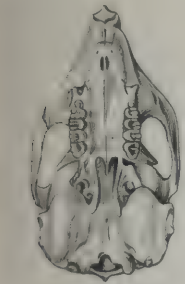
E. Weissroth del. Dougal sc.

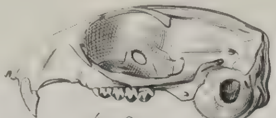


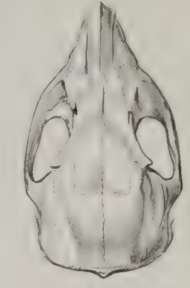
[illegible] del. Dougal sc.

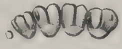


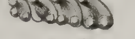
Dougal sc.


4 a

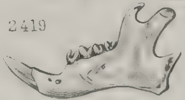

4 c

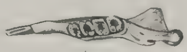

4 b

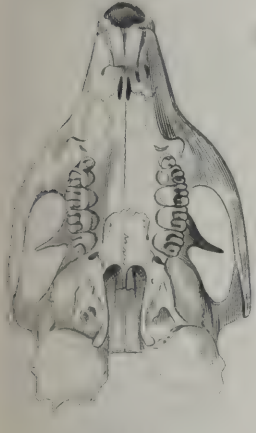

4 f

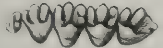

4 g

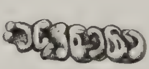
2419

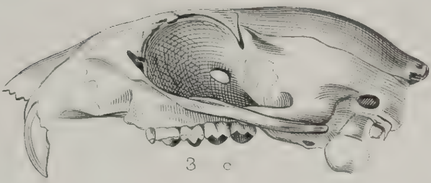

4 d

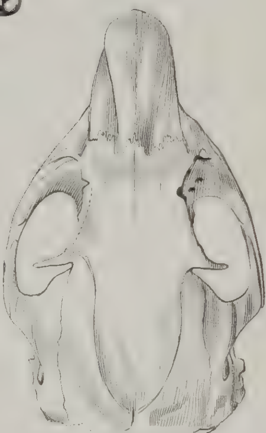

4 e


3 a

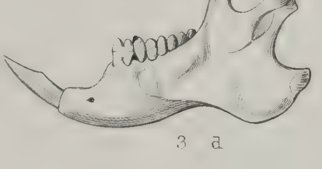

3 f

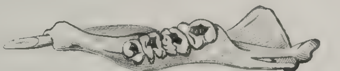

3 g

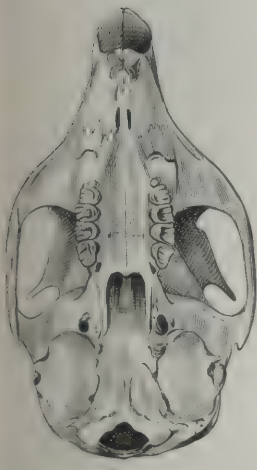

3 c

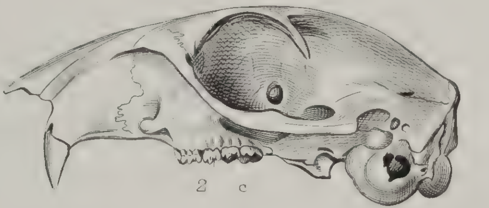

3 b

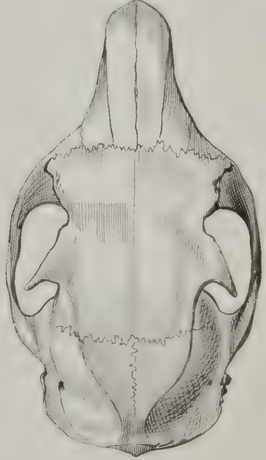
1255


3 d

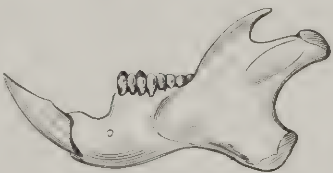

3 e

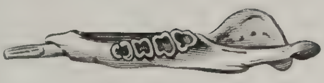

2 a

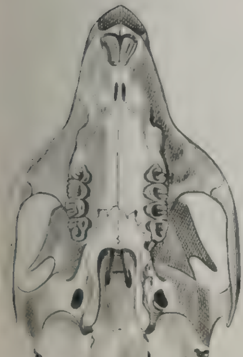

2 c

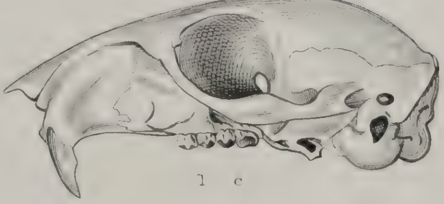

2 b

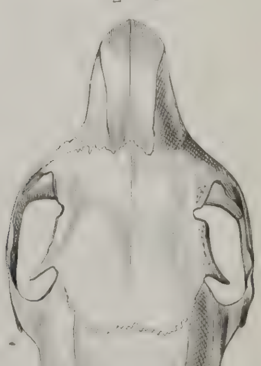
1107


2 d

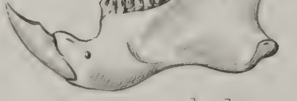

2 e

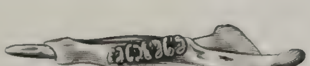

1 a


1 c

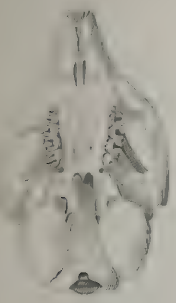

1 b

1265

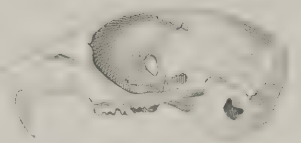

1 d


1 e

[illegible] del. Dougal sc.

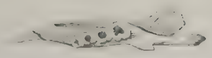


3 a

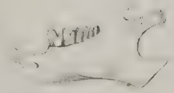


3 c

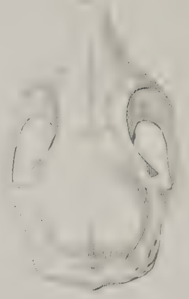
1146



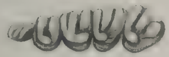
3 e



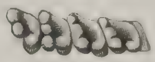
3 d



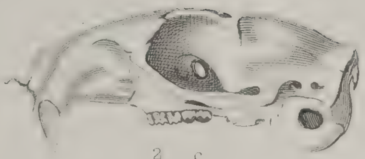
3 b



3 f

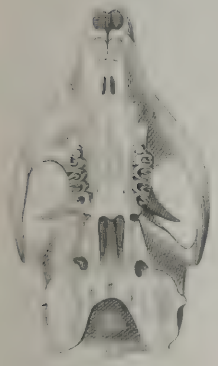


3 g

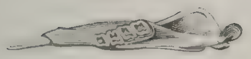


2 c

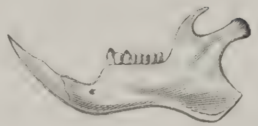
1267



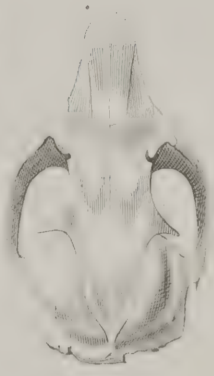
2 a



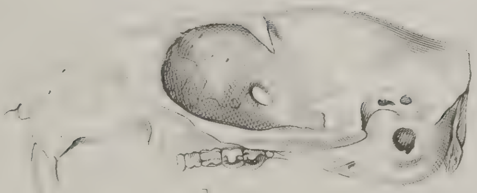
2 e



2 d

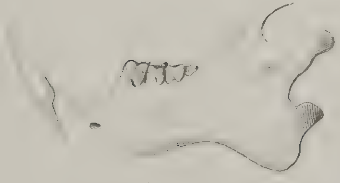


3 b

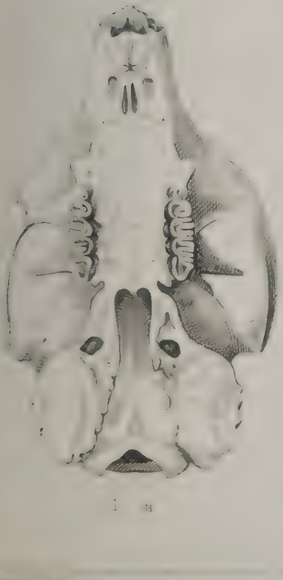


1 c

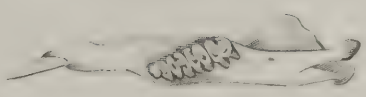
1111



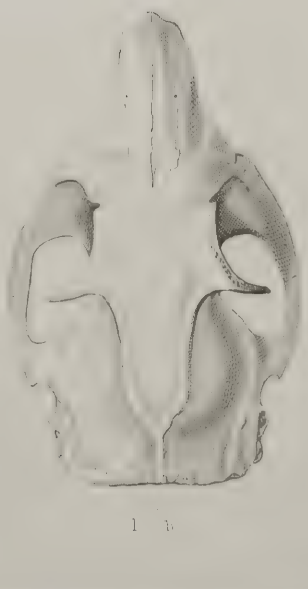
1 d



1 a

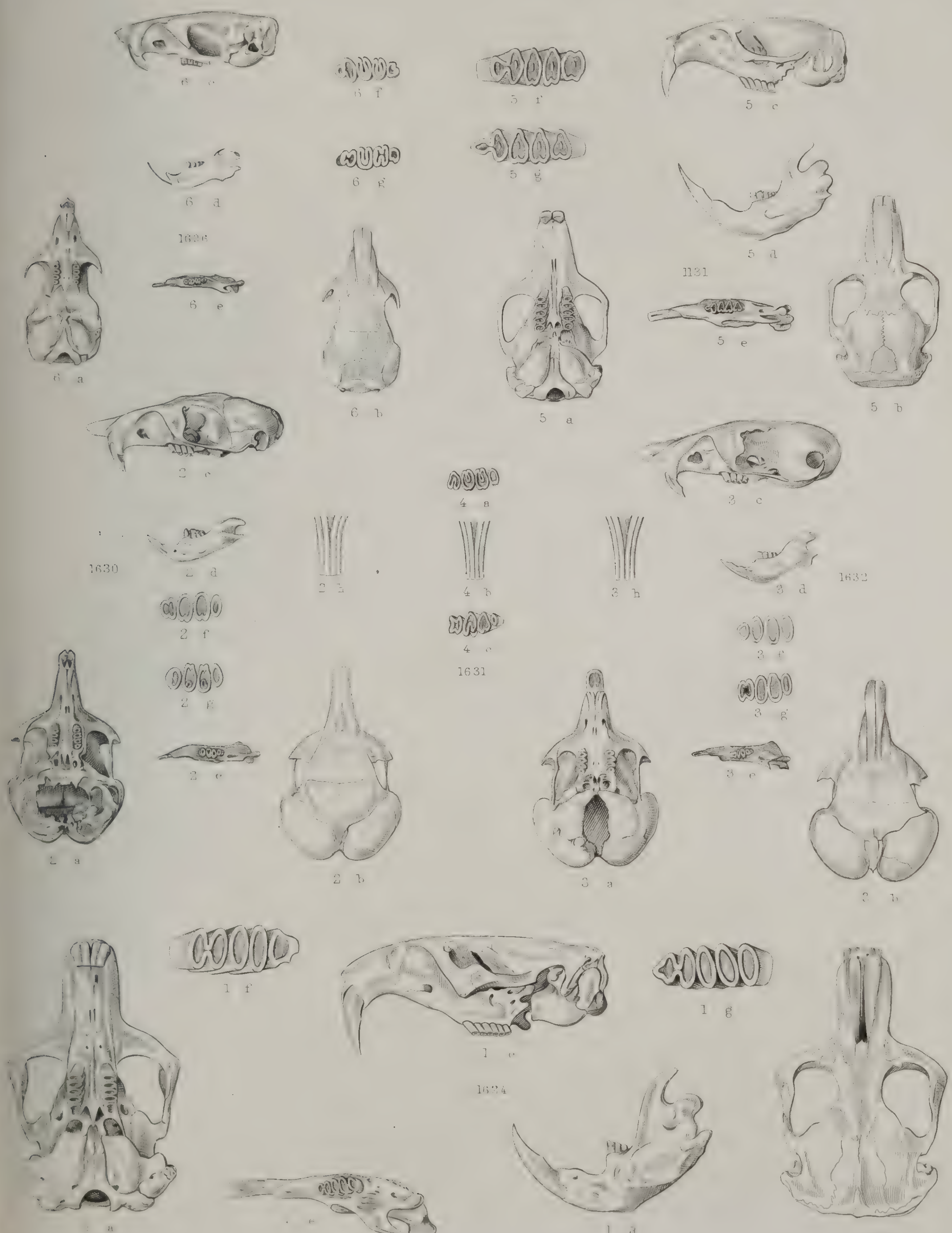


1 e

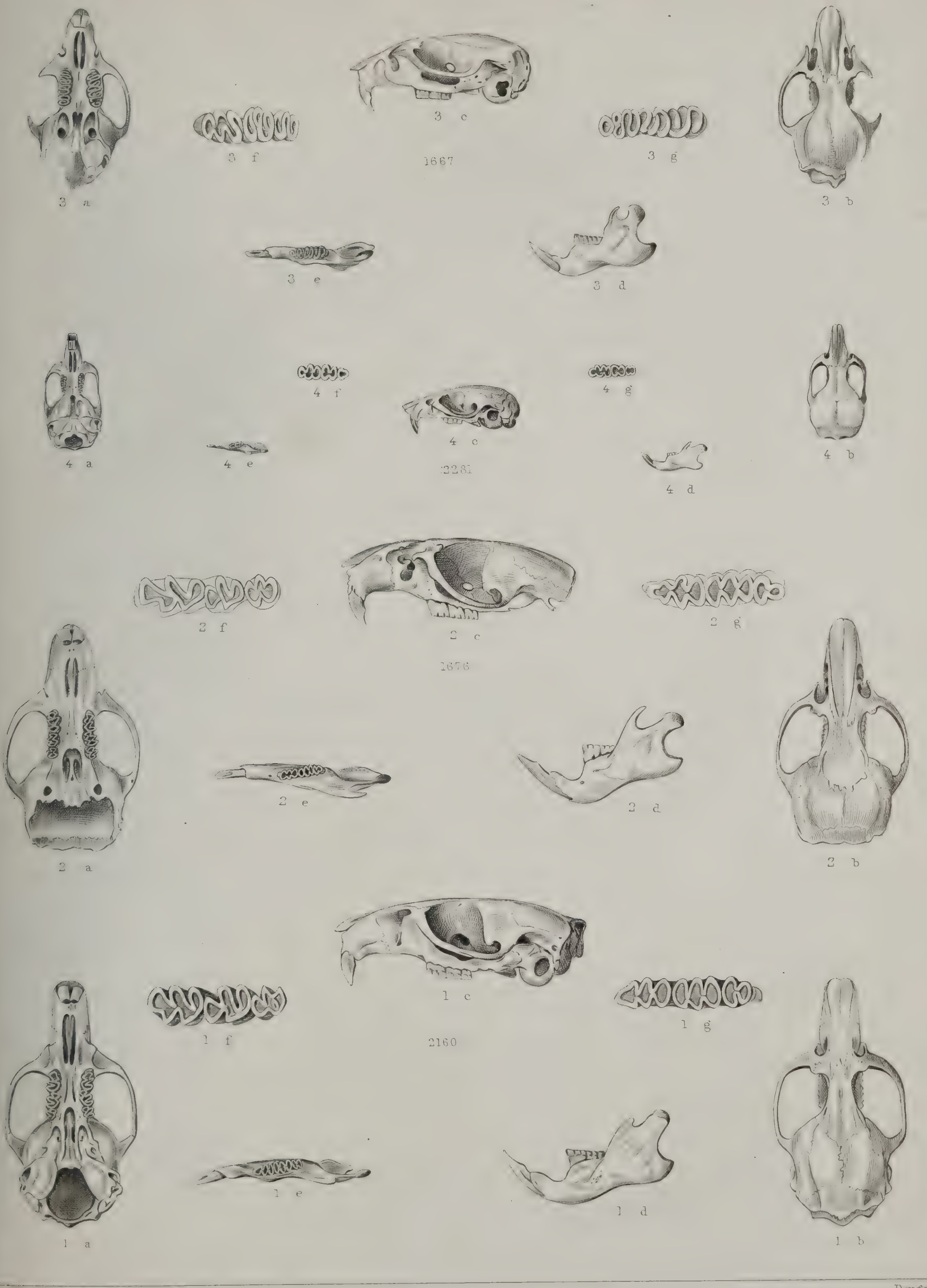


1 b

[illegible] Dougal sc.

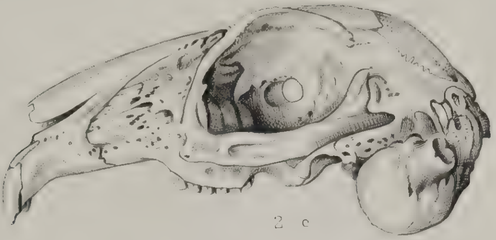


[illegible] & Mohrmann del.
Dougal sc.

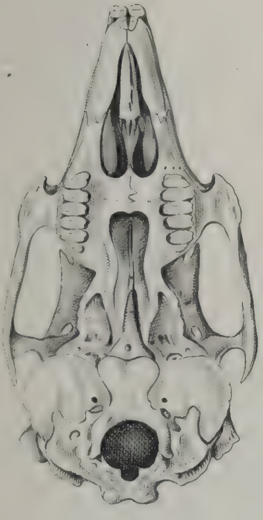


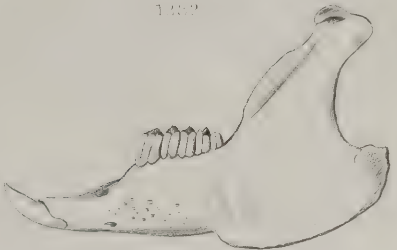
H. Richard del.

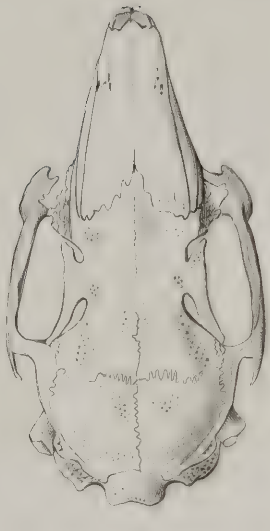
Dougal sc.

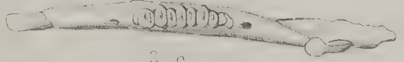

2 c

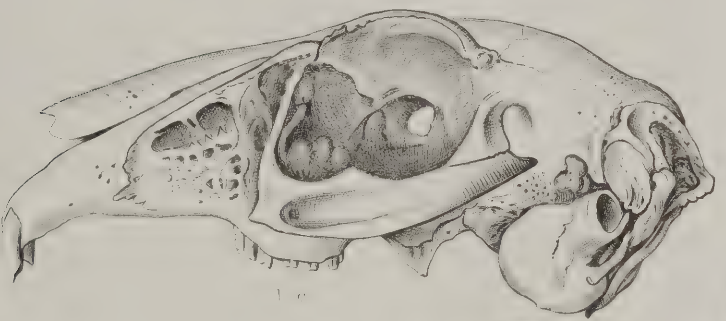
1232


2 a

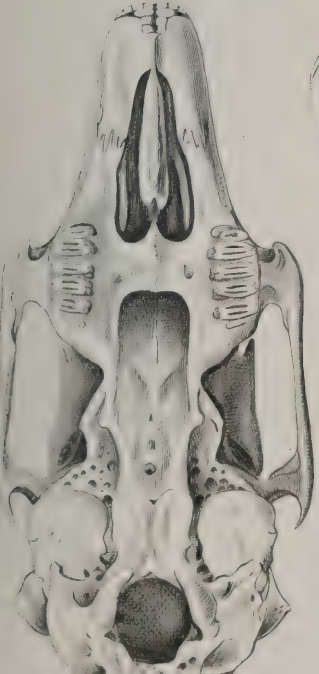

2 d

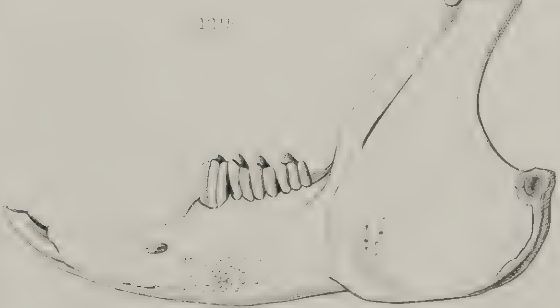

2 b

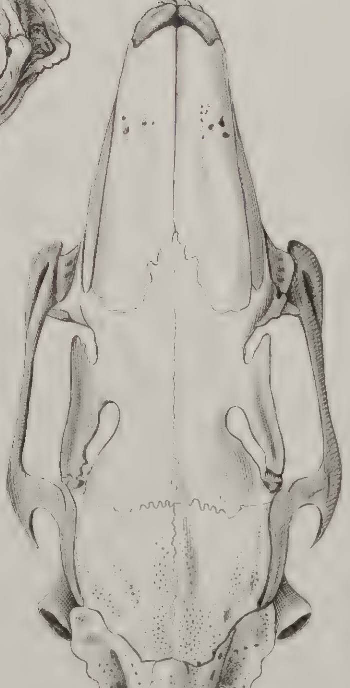

2 e


1 c

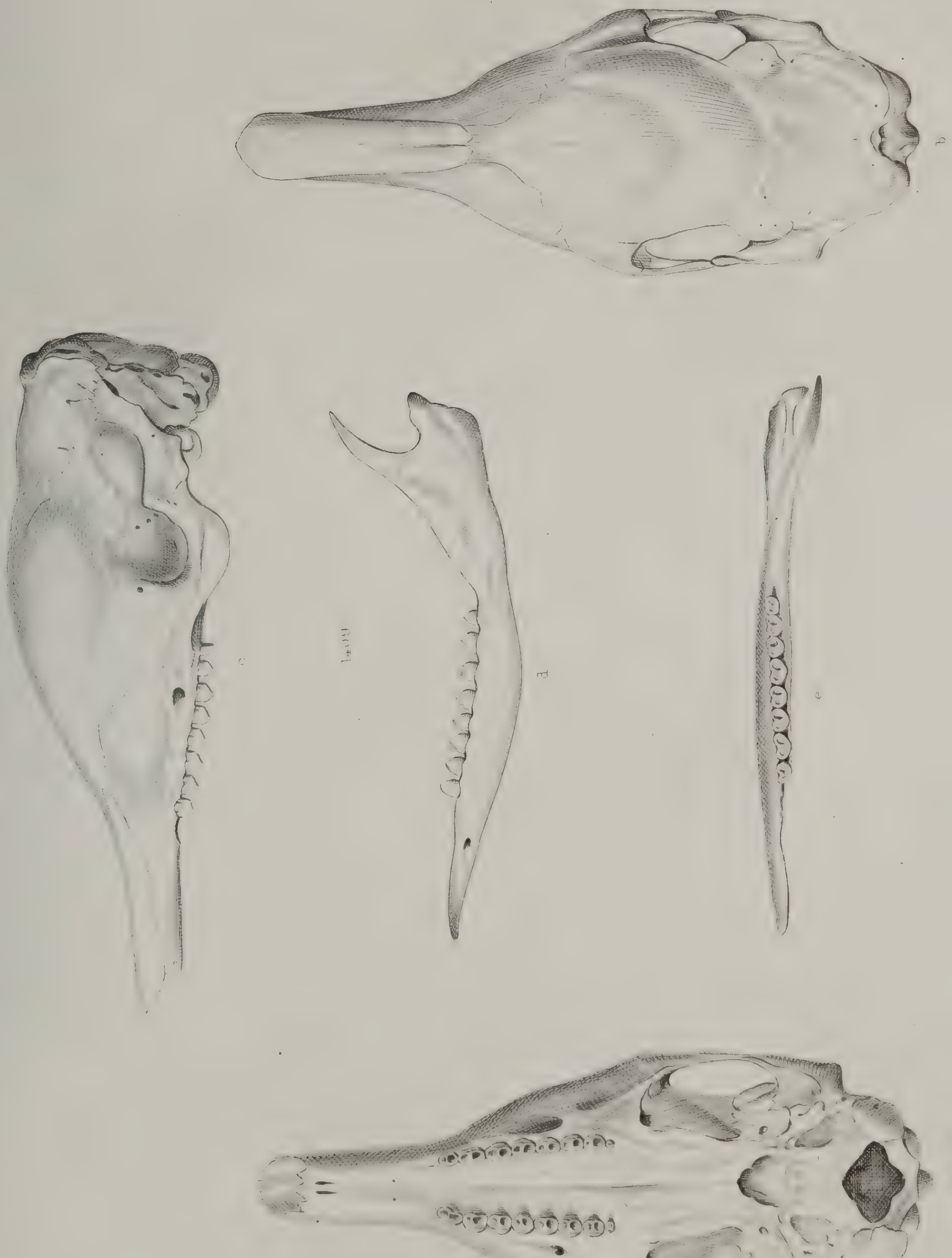
1215


1 a

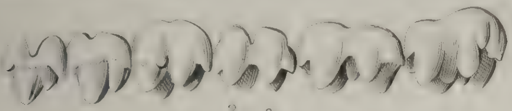

1 d


1 b

1 e

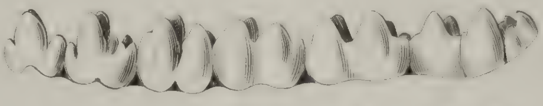


i & Metzeroth del. Dougal sc.

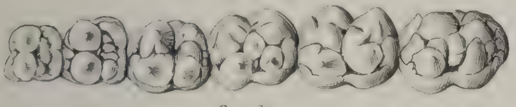


2 a

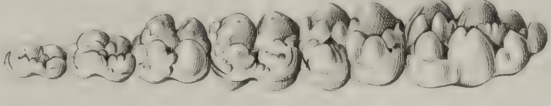
1008



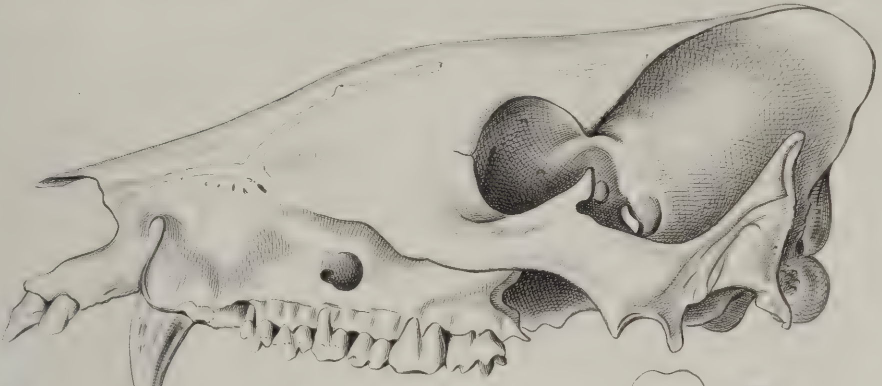
2 c



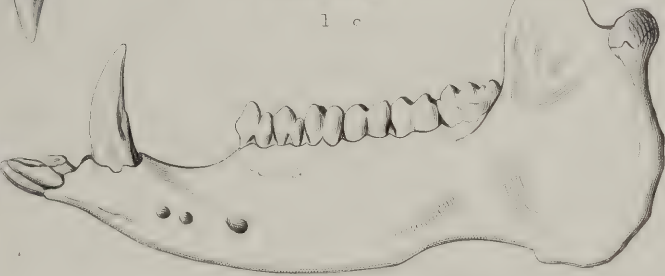
2 b



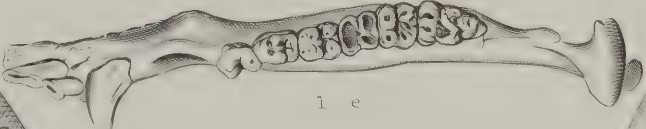
2 d



1 c

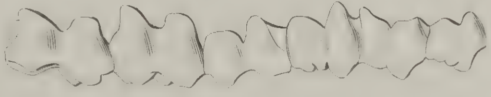


1 d

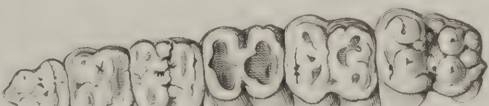


1 e

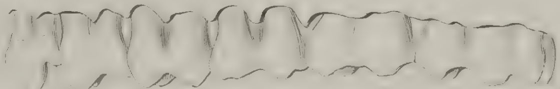
1101



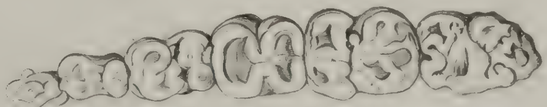
1 f



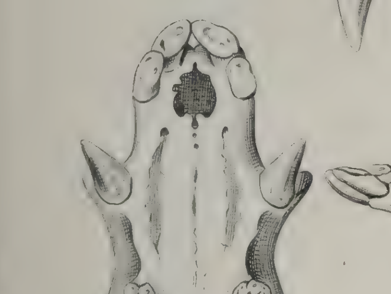
1 g



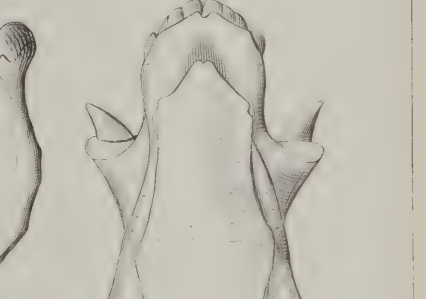
1 h



1 i



1 a



1 b

R. Metzeroth del.

Dougal sc.

UNITED STATES AND MEXICAN
BOUNDARY SURVEY,

UNDER THE ORDER OF

LIEUT. COL. W. H. EMORY,

MAJOR FIRST CAVALRY, AND UNITED STATES COMMISSIONER.

BIRDS
OF THE BOUNDARY,

BY

SPENCER F. BAIRD,.

ASSISTANT SECRETARY OF THE SMITHSONIAN INSTITUTION.

WITH NOTES BY THE NATURALISTS OF THE SURVEY

REPORT ON THE BIRDS.

---

1. CATHARTES AURA. Ill. (Gen. Rep. p. 4.)*—Turkey Buzzard.

8497. Matamoras, Mexico; Lieut. Couch.

2. FALCO COLUMBARIUS, L. (p. 10.)—Pigeon Hawk.

5505. El Paso. J. H. Clark—4615. Colorado river California. A. Schott.

Quite common; flies but little, generally watches for its quarry from the limb of a dry tree.—(Couch.)

3. FALCO AURANTIUS, Gm. (p. 10.)

4129. New Leon, Mexico. Lieutenant Couch. (145.)

Has a soft cry or scream. Eats insects and small birds; very rare; and retired in its habits.—(Couch.)

4. FALCO FEMORALIS, Temm. (p. 11.)

Observed in New Mexico near the boundary line by Dr. Heermann.

5. FALCO SPARVERIUS, Linn. (p. 13.)—Sparrow Hawk.

4570. San Felipe, Texas. A. Schott.—8518, San Elziario, Texas. Dr. Kennerly.

Observed more frequently in the valley of the Rio Grande than elsewhere.—(Kennerly.)

6. ACCIPITER COOPERI, Bon. (p. 16.)—Cooper's Hawk.

? 4619. Colorado river, California. A. Schott, (53.)

7. ACCIPITER FUSCUS, Gmelin, (p. 18.)—Sharp-shinned Hawk.

8513. Camp Yuma, California. A. Schott, 23.

8. BUTEO SWAINSONII, Bon. (p. 19.)

Pecos River.

9. BUTEO CALURUS, Cassin. (p. 22.)

Copper Mines, New Mexico.

10. BUTEO BOREALIS, Gm. (p. 25.)—Red-tailed Hawk.

?? 4617. Jamacha Ranch, California, and Santa Isabel, California. A. Schott. (7,14.)

11. BUTEO MONTANUS, Nutt. (p. 26.)—Western Red-tail.

4611. California. A. Schott.—8536, Laguna, and 8532, Devil's river, Texas. Dr. Kennerly.

The bird was often seen between the coast of Texas at Indianola and the Rio Grande at El Paso del Norte. It seemed to feed indifferently upon reptiles, particularly lizards, and the smaller quadrupeds and birds. The stomach of the specimen was almost completely filled with lizards.—(Kennerly.)

12. BUTEO ELEGANS, Cassin. (p. 28.)

4618. Santa Isabel, California. A. Schott, 23.

---

* These references are to the page of the general report on birds in vol. IX of the series of Pacific Railroad Reports, where the species are all described in detail, and their synonyms given.

13. ARCHIBUTEO FERRUGINEUS, Gray, (p. 34.)—Squirrel Hawk.

9122. Fort Davis, Texas. Dr. Kennerly, (2.)

The only specimen procured. Observed in "a prairie dog town," of large extent, intently watching at a hole of one of those animals. While in this position, was observed to strike at the prairie dog with its claw when its head was protruded. Being very intent upon its prey it was easily approached and shot.—(Kennerly.)

14. ASTURINA NITIDA, Bonap. (p. 35.)

4128. New Leon, Mexico. Lieut. Couch.

15. CIRCUS HUDSONIUS, Vieillot. (p. 38.)—Marsh Hawk.

5548. San Elziario, Texas, December, 1854. Dr. Kennerly.

Wherever we found a marsh of any extent, either east or west of the Rio Grande, there we were sure to find this bird. Flying near the surface, just above the weeds and canes, it performs its endless circles hour after hour, ever and anon darting after the small birds that it starts from their cover. Sometimes, when pressed by hunger, it will attack the ducks, particularly the smaller ones, as teal, &c., that may be feeding in the lagoons.—(Kennerly.)

16. PANDION CAROLINENSIS, Bon. (p. 44.)—Fish Hawk.

4616. Colorado river, California. A. Schott.

17. POLYBORUS THARUS, Cassin. (p. 45.)—Caracara.

4122. Monterey, Mexico. Lieut. Couch.—9136. Texas. A. Schott.

This species is exceedingly abundant from the Rio Grande to the Sierra Madre. A male was killed on the nest, which is composed of sticks on quite low trees.

It destroys large numbers of the Texas field-rat (*Sigmodon berlandieri.*)—(Couch.)

18. CRAXIREX UNICINCTUS, Cassin. (p. 46.)—Harris' Buzzard.

4123. Brownsville, Tex. Lt. Couch.—Oyster Point, Tex. A. Schott.

19. STRIX PRATINCOLA, Bon. (p. 47.)—Barn Owl.

8701. Texas. A. Schott.—9132. Texas. J. H. Clark.

Found nesting in May in holes burrowed into the bluff banks of the Rio Frio. The burrows were nearly horizontal, with a considerable excavation near the back end, where the eggs (three or four in number and of a dirty white) were deposited. It allows the eggs to be handled without showing any concern. There was no lining whatever to the nest.—(Clark.)

Rare at Monterey. Common on the lower Rio Grande. There it frequently lives in the sides of the large deep wells.—(Couch.)

20. BUBO VIRGINIANUS, Bon. (p. 49.)—Great Horned Owl.

4613. Colorado river, Cal. A. Schott.—9157. Devil's river, Tex. Dr. Kennerly.—4137. Monterey, Mex. Lt. Couch.

My specimen was procured in the cañon of the river, where there was heavy live-oak (*Quercus virens*) timber. It seemed, however, to live indifferently among the trees and the high and precipitous cliffs. This bird is found throughout Texas and New Mexico, where there are either large trees or deep and dismal cañons, affording a secure hiding place during the day.—(Kennerly.)

21. SCOPS McCALLI, Cassin. (p. 52.)—Texas Screech Owl.

PLATE I.

9171. Texas. September 3, 1853. A. Schott.

22. ATHENE HYPUGAEA, Bon. (p. 59.)—Prairie Owl.

9164. Fort Davis, Tex. J. H. Clark.—El Paso. J. H. Clark.—4136. Tamaulipas, Mex. Lt. Couch.

Seen only in the prairie dog town, and, in conjunction with the rattlesnake, feeding on the young prairie dogs.—(Clark)

23. ATHENE CUNICULARIA, Molina. (p. 60.)—Burrowing Owl.

4614. San Diego, Cal. A. Schott.

24. RHYNCHOPSITTA PACHYRHYNCHA, Bon. (p. 66.)—Thick-billed Parrot.

Rio Grande, Texas. J. W. Audubon.

25. TROGON MEXICANUS, Swains. (p. 69.)—Mexican Trogon.

PLATE II.

4338. Boquillo, New Leon, Mex. Lt. Couch, (138.)—4339. Do. (145.)

26. GEOCOCCYX CALIFORNIANUS, Baird. (p. 73.)—Chaparral Cock.

6184. Rio Grande, N. M. A. Schott.—Ringgold Barracks, Tex. J. H. Clark.—6177. Eagle Pass, Texas. A. Schott.—4576. Fort Yuma, Cal. A. Schott.—4053. ♀ Tamaulipas, Mex. March, 1853. Lt. Couch, 87.

This bird is called *Correr del Paisano* by the Mexicans, usually shortened into *Paisano.* Found throughout Texas and west of Rio Grande. At times it seems exceedingly stupid and suffers itself to be knocked over with a stick ; and again it would require a greater speed than that of a mule to overtake it. When alarmed it erects its crest and cocks up its long tail, but in the act of running it hangs as if it was a weight to carry. Its feeding upon the snail is a well established fact, and indications of it are seen at every hand on the lower Rio Grande. It does not extend its wings when running, nor did I ever see it attempt to fly. Is said to be carnivorous ; the margins of lakes are a favorite resort.—(Clark.)

This species is generally solitary, never in flocks. Usually moves at a slow pace ; but if frightened, runs with great rapidity. A great enemy of the rattlesnake. It often meets that scourge in pitched battle, spreading its wing as a foil to receive the dart of the opponent, at the same time giving a sharp blow with its powerful beak. It thus quickly discomfits and kills its antagonist.—(Couch.)

27. PICUS HARRISII, Aud. (p. 87.)—Harris' Woodpecker.

4589, ♂ ; and 6080, ♀. Santa Isabel, Cal. November 26, 1854. A. Schott, (17.)

28. PICUS SCALARIS, Wagler. (p. 94.)

PLATE III.—*Male and Female.*

6106. ♀. Boca Grande, Mex. Dr. Kennerly, 35.—6107. ♂. Espia, Mex. Dr. Kennerly, 52.—4594. ♀. Colorado river, Cal. A. Schott, 40.—4605. ♂. Gila river, New Mex. Dec. 24, 1854. A. Schott, 54.—6114. ♂. Rio Grande, Tex. J. H. Clark, 27.—6113. ♀. San Pedro, Tex. Sept. 10, 1853. J. H. Clark.—6103. ♂. Texas. Do., 19.—6105. ♂. Tamaulipas, Mex. Lt. Couch.—4040. ♀. New Leon, Mex. Do., 76.—4039. Do.

Not uncommon in the vicinity of Boca Grande ; generally found wherever there were large trees.—(Kennerly.)

29. CENTURUS FLAVIVENTRIS, Sw. (p. 110.)—Yellow-bellied Woodpecker.

PLATE IV.—*Male and Female.*

6125, 6126. Eagle Pass, Tex. A. Schott.—6122, 6123, 6124. Ringgold Barracks. July, 1853. J. H. Clark.—4036. ♂. Matamoras, Mex. March 1, 1853. Lt. Couch.

This species, though abundant on the lower Rio Grande, is shy. It keeps chiefly about the mezquite.—(Clark.)

Very common throughout Tamaulipas.—(Couch.)

30. CENTURUS UROPYGIALIS, Baird. (p. 111.)—Gila Woodpecker.

4568, 6129. ♀. Gila river, Cal. A. Schott, 22.

31. MELANERPES FORMICIVORUS, Bonap. (p. 114.)—California Woodpecker.

4606. Santa Isabel, Cal. December 26, 1854. A. Schott.—6147. Los Nogales, Mex. June, 1856. Dr. Kennerly.—6149 and 6148. Copper Mines, New Mex. J. H. Clark.—4033. ♂. (162) and 4034 (196.) New Leon, Mex. 1853. Lt. Couch.

These appeared in great numbers about the Copper Mines early in the fall, and seemed to feed principally among the oak. By stationing myself near one of their resorts, I could shoot down any number, one by one, without driving them off; and once or twice, when a wounded one would struggle and make efforts to get off, and be some time falling to the ground, the rest would follow it, occasionally striking it and flying round and round it, as if examining into his case without comprehending the cause.—(Clark.)

In the recesses of the Sierra Madre this bird was quite common and tame. It generally resorts to high trees to find its food. Among the natives it is held in high estimation for its supposed medicinal properties. It is taken (dried) in a tea, used in cases of pulmonia and heart disease. Not seen east of the Sierra Madre.—(D. N. Couch.)

This bird was first observed in the vicinity of Santa Cruz, where it was very common on the mountain slopes, always preferring the tallest trees. It was here very shy, and it was with some difficulty that a specimen could be procured.—(Kennerly.)

32. COLAPTES MEXICANUS, Swains. (p. 121.)—Red-shafted Flicker.

4041. ♀. Saltillo, Mex. May, 1853. Lt. Couch—6159. San Elziario, Tex. Dr. Kennerly. December, 1854.

First seen in the high plateaus of Agua Nueva, Coahuila. In habits seemed to be identical with the analogous species from eastern New York.—(Couch.)

Not an uncommon bird in this locality. At this season generally found solitary. Wild and cunning.—(Kennerly.)

33. COLAPTES CHRYSOIDES, Malh. (p. 125.)

? 4569. Boundary line. A. Schott.

34. TROCHILUS COLUBRIS, Linn. (p. 131.)—Ruby-throated Humming Bird.

3962. Brownsville, Tex. Lt. Couch.—3963. Santa Caterina, Mex. Lt. Couch.

35. TROCHILUS ALEXANDRI, Bourc. (p. 133.)—Black Chinned Humming Bird.

Plate V.—Fig. 3.—*Male.*

Not uncommon in southern California.

36. SELASPHORUS RUFUS, Swains. (p. 134.)—Red-backed Humming Bird.

6067. El Paso, Tex. J. H. Clark.

37. SELASPHORUS PLATYCERCUS, Gould. (p. 135.)—Broad-tailed Humming Bird.

Plate V.—Figs. 1, 2.—*Male and Female.*

6066. ♂. El Paso, Tex. J. H. Clark.

38. ANTROSTOMUS NUTTALLI, Cassin. (p. 149.)—Nuttall's Whippoorwill.

6002. ♀. Rio Mimbres, New Mex. J. H. Clark.

From the way in which this bird flies, and particularly its rising and striking, it reminded me so much of the woodcock, that before obtaining a specimen, I thought it belonged to that family. It was not seen east of the Rio Grande, but I found it at various points west as far as Santa Cruz, the westernmost point reached by me. Not abundant, and usually solitary, occasionally two were flushed together. Found usually in the tall grass of the valley, sometimes on the plains. There was but one observed instance of its alighting in a bush, most frequently pitching into the grass at short distances, no matter how often it was frightened up.—(Clark.)

39. CHORDEILES HENRYI, Baird. (p. 151.)—Night Hawk.

?6013. Los Nogales, Sonora. June, 1855. Dr. Kennerly, 83.

Very common in this vicinity; coming in great numbers around the camp late in the afternoon; circling round and round, and approaching the earth nearer and nearer with the declining sun.—(Kennerly.)

40. CHORDEILES TEXENSIS, Lawrence. (p. 154.)—Texas Night Hawk.

PLATE VI.

6009. Ringgold Barracks, Tex. July, 1853. J. H. Clark.—6010 and 6012. Eagle Pass, Tex. A. Schott.—4577. Colorado river, Cal. A. Schott.

At Ringgold Barracks in the month of June; could be seen sitting about during the heat of the day, when it was easily approached. During the hotter days it would not sally forth in quest of food till late in the evening. On one occasion, near El Paso, I saw these birds so thick over a mud hole, that had given birth to myriads of insects, that I felt that a discharge of mustard seed shot into their midst would be a wanton destruction. This bird was not known to make the swoop and hoarse sound so common to our bull bat, nor does it fly so high.—(Clark.)

41. CERYLE ALCYON, Boie. (p. 158.)—Belted King-fisher.

3960. Tamaulipas, Mex. Mar. 1853. Lieut. Couch—4587. Colorado river, Cal. A. Schott.

42. CERYLE AMERICANA, Boie. (p. 159.)—Texas King-fisher.

PLATE VII.

7102 ♀ and 7103 ♂, Western Texas. J. H. Clark, 9.

43. MOMOTUS CAERULICEPS, Gould. (p. 161.)—Saw-bill.

PLATE VIII.

4337 ♂, Boquillo, New Leon, Mex. Lieut. Couch, 141.

44. PACHYRHAMPHUS AGLAIAE, Lafres. (p. 164.)—Rose-throated Flycatcher.

PLATE IX, fig. 1, male.

4024 ♂ and 4025 ♂, San Diego, New Leon. Lieut. Couch.

45. BATHMIDURUS MAJOR, Cabanis. (p. 165.)

PLATE IX, Fig. 2, female.

4026. Boquillo, New Leon, Mex., April, 1853 ♀. Lieut. Couch, 150.

46. MILVULUS FORFICATUS, Sw. (p. 169.)—Scissor-Tail.

7337. Eagle Pass. A. Schott.—7382. Lower Texas. J. H. Clark.—3997. Tamaulipas, Lieut. Couch.

Usually called Scissor-tail, sometimes Bird of Paradise. Not occurring west of the valley of the Rio Pecos. Always seen following one another through the air, or perched upon some solitary twig. In its gyrations, the scissors are always more or less expanded and impress one with the idea of balancers. Their nests were built of sticks, lined on the inside though not very softly with grass, invariably on dry limbs of the mesquite. Contained from 3 to 5 eggs, speckled; and more than one pair always seem to have interest in the same nest, over which they are very watchful and give proof of courage when interfered with, by darting at the intruder. Their note short and sharp, without much variation, can be heard at a good distance. The Mexicans imagine that they live upon the brains of other birds.—(Clark.)

This bird is rather shy, but of very lively disposition—sometimes three or four are seen in company, evidently preferring the thinly wooded prairies to close thickets.

In beauty it is considered the queen of all birds found in Northern Tamaulipas. This superiority is not owing to the brilliancy of plumage, for in that it is excelled by several species, but to the inimitable grace and charm of its flight—rising from the topmost branch of some Acacia, it seems to float rather than fly—then descending perpendicularly it retakes its position uttering its usual note. Not seen west of Cadereita.—(Couch.)

47. TYRANNUS VOCIFERANS, Swains. (p. 174.)—Cassin's Fly-catcher.

Plate X.

4579. Colorado river, Cal. A. Schott.—7204, Los Nogales, Mex., Jan., 1855. Dr. Kennerly.

48. TYRANNUS COUCHII, Baird, (p. 175.)—Couch's Fly-catcher.

Plate XI, Fig. 1.

4001 ♂ New Leon, Mex. Lieut. Couch.—4002. San Diego, Mex. March, 1853.—4003 ♂, Lieut. Couch. April, 1853. San Diego, Mex.

The tail of *T. melancholicus,* is represented on plate XI, fig. 2, for comparison.

Very common and noisy; found among the large trees of gardens and luxuriant river bottoms.—(Couch.)

49. MYIARCHUS MEXICANUS, Baird, (p. 179.)—Ash-throated Fly-catcher.

4608. Colorado bottom, Cal., March 31, 1854. A. Schott, 38.—4588. Gila river, N. M., Dec. 31, 1854. A. Schott, 38.—7208, Los Nogales, Mex., June, 1853, Dr. Kennerly.—7211 ♂ Frontera, Tex. J. H. Clark, 32.—7213. Eagle Pass, Tex. A. Schott.—7212 ♀, Saltillo, Coahuila, Mex., May, 1853. Lieut. Couch, 221.

Observed most abundantly in damp places, or near the water.—(Clark.)

Found among the mesquite bushes.—(Couch.)

Very common in the vicinity of Los Nogales. When two are together they make continually a loud chattering noise.—(Kennerly.)

50. MYIARCHUS LAWRENCII, Baird, (p. 181.)—Lawrence's Fly-catcher.

Plate IX.—Fig. 3.—*Female.*

10028 ♀. San Diego, New Leon. Spring, 1853. Lt. Couch, 110.

Has a pleasant note.—(Couch.)

51. SAYORNIS NIGRICANS, Bonap. (p. 183.)—Black Fly-catcher.

7214 ♀, Espia, Mex. 1855. Dr. Kennerly, 54.—4004, ♂ Cadereita, Mex. April 1853. Lt. Couch—4005, ♀ do.

Found at Cadereita under the high banks of the stream which supplies the town with water; its habits are much the same as those of the Phœbe bird (Sayornis fuscus.) Its nest was probably in the bank.—(Couch.)

The habits of this bird were not observed to differ from those of the *Pyrocephalus rubineus.* They were observed in the same vicinity, feeding alike on insects and having the same motions.—(Kennerly.)

52. SAYORNIS FUSCUS, Baird, (p. 184.)—Pewee.

4009. Brownsville, Tex. February, 1853. Lt. Couch, 22.—4008 ♀, Tamaulipas, Mex. March. Lt. Couch, 92.

53. SAYORNIS SAYUS, Baird. (p. 185.)—Say's Fly-catcher.

7230. Copper Mines, New Mex.; (Fort Webster.) J. H. Clark.—4602. Santa Isabella, A. Schott, 18.—7231 ♂ Espia, Mex. March 1, 1855. Dr. Kennerly, 55.

Particularly abundant about the Copper Mines. One of the shafts near the fort, and which was partially filled up, served as a sink hole for all the offal of the town, and around this a dozen or more of these birds could always be seen in pursuit of flies and insects that this sink hole had attracted or given birth to. Their sudden darting from their perch and instantaneous return is not always attended with the destruction of an insect; for this seems to be done at times apparently for amusement or exercise.—(Clark.)

This bird was rare and very shy. Its habits the same as the others of the same genus.—(Kennerly.)

54. CONTOPUS RICHARDSONII, Baird. (p. 189.)—Short-legged Pewee.

7235. El Paso, Tex. J. H. Clark.—7251, ♂. Monterey, Mex., May, 1853. Lt. Couch, 212.

55. EMPIDONAX PUSILLUS, Cab. (p. 194.)

7244. Los Nogales, Mex. June, 1855. Dr. Kennerly 74.—7252 ♂. Rio Nasas, Durango. June, 1853. Lt. Couch, 240.

56 EMPIDONAX OBSCURUS Baird. (p. 200.)

PLATE XI.—Fig. 3.

7234 ♂? and 7237 ♂. El Paso, Tex. C. Wright.

57. PYROCEPHALUS RUBINEUS, Gray. (p. 201.)—Red Fly-catcher.

7224 ♂. Fort Yuma, Cal. A. Schott—7222. ♂ Boca Grande, Mex. March, 1855. Dr. Kennerly, 44.—7232. ♀ Espia, Mex. do. 53.—7221. ♂ San Bernardino, Mex. May, 1855. Do. 70.—4012. ♂ Charco Escondido, New Leon, Mex. March, 1853. Lt. Couch, 70.—4013. ♀ Santa Caterina, Mex. April, 1853. Do. 181.

Habits quiet; male precedes the female by several weeks; evidently winters south of Monterey.—(Couch.)

Often observed at various points on the road from Boca Grande to Los Nogales. It generally selects its perch on the topmost branch of some bush or tree, awaiting the approach of its insect food, when it sallies out to capture it; sometimes beautifully poising itself in the air, while its bright plumage glistens in the sun like some richly colored flower.—(Kennerly.)

58. TURDUS NANUS, Aud. (p. 213.)—Dwarf Thrush.

8170. Frontera, Texas. C. Wright.

59. SIALIA MEXICANA, Sw. (p. 223.)—Western Blue Bird.

4575. Gila river, New Mexico. A. Schott 24.—4020, ♀. Saltillo, Mexico. May, 1853. Lieut. Couch.

Only seen in the mountains of Aqua Nueva, at an elevation of 7,000 feet. Habits apparently the same or similar to those of *S. sialis.*—(Couch.)

60. SIALIA ARCTICA, Sw. (p. 224.)—Rocky Mountain Blue Bird.

7608. Espia, Mexico. March, 1853. Dr. Kennerly.

Frequently observed at different points along the Corralitos river, frequenting the vicinity of the camp early in the morning. Sometimes in pairs, and at other times four or five or more associated.—(Kennerly.)

61. REGULUS CALENDULA, Licht. (p. 226.)—Ruby-crowned Wren.

7172. Espia, Mex. March, 1855. Dr. Kennerly, 63.—7174. Boca Grande, Mex. do. 43.

Observed in pairs frequenting the cotton-wood trees (*Populus*) and feeding among its flowers and tender buds Very active, passing rapidly from branch to branch.—(Kennerly.)

62. ANTHUS LUDOVICIANUS, Licht. (p. 233.)—Tit Lark.

7931 ♀. Espia, Mexico. March, 1855. Dr. Kennerly, 57.

Observed only at Espia, and there very rare. Seen early in the morning in the vicinity of or immediately on the shore of the river busily searching for food. In its motions on the ground it somewhat resembles the common meadow lark (*Sturnella neglecta*). While walking from point to point its body continually performs a bowing motion.—(Kennerly.)

63. GEOTHLYPIS TRICHAS, Cabanis. (p. 241.)—Maryland Yellow-throat.

3990 and 3992. Brownsville, Texas. Lieut. Couch.

64. GEOTHLYPIS MACGILLIVRAYI, Baird. (p. 244.)—Macgillivray's Warbler.

3988, 3989. Monterey, Mex., May, 1853. Lieut. Couch, 205, 213.

Only seen on the slopes and ravines of the Sierra Madre, near Monterey.—(Couch.)

65. ICTERIA LONGICAUDA, Lawrence. (p. 249.)—Long-tailed Chat.

8175. Frontera, May 10, 1852. Charles Wright.—3978 ♂. New Leon, Mexico, March, 1853. Lieut. Couch, and 3979 ♂ do.

No note but that of a feeble chirp observed; found among low bushes.—(Couch.)

66. HELMINTHOPHAGA CELATA, Baird. (p. 257.)—Orange-crowned Warbler.

3994. Brownsville, Tex. Lieut. Couch.—3945 and 3993. Tamaulipas, Mex. Do. 50 and 41.

Generally seemed to seek its food and make its home among the low shrubbery.—(Couch.)

67. SEIURUS LUDOVICIANUS, Bonap. (p. 262.)—Long-billed Water Thrush.

4021 ♀. Tamaulipas, Mexico, March, 1853. Lieut. Couch, 93.

Only one of the species seen; it appeared to have been attracted to the tank at La Coma for water.—(Couch.)

68. DENDROICA VIRENS, Baird. (p. 267.)—Black-throated Green Warbler.

3987. China, Tamaulipas, Mexico, March, 1853. Lieut. Couch.

69. DENDROICA AUDUBONII, Baird. (p. 273.)—Audubon's Warbler.

7651. Janos, Mexico, April, 1855. Dr. Kennerly, 67.—7652. Boca Grande, Mexico, March, 1855; do. 34.—7653. San Bernardino; do. 69.

When observed, frequenting the cotton-wood trees, preferring the topmost branches, and apparently feeding on insects among the young and tender buds. Not very common at Boca Grande. Observed again at Janos and at San Bernardino, in Sonora.—(Kennerly.)

70. DENDROICA AESTIVA, Baird. (p. 282.)—Yellow Poll.

7644. Frontera, Texas. C. Wright.

71. DENDROICA SUPERCILIOSA, Baird. (p. 289.)—Yellow-throated Warbler.

3986. ♀ Tamaulipas, Mexico, 1845. Lieut. Couch, 74.

72. MYIODIOCTES PUSILLUS, Bonap. (p. 293.)—Green Black-cap Fly-catcher.

7675 ♂; 7676 ♂; 7677 ♀; May 5, 1852; Frontera. Charles Wright.—7685 ♀. Frontera. J. H. Clark.—3982 ♀. Monterey, Mexico. Lieut. Couch, 207.—3981 ♀, do. 214—and 3980 ♀; May, 1853, do.

Seemed to have a feeble voice; was most abundant in the mountains.—(Couch.)

73. SETOPHAGA PICTA, Swainson. (p. 298.)

4014 ♂. Boquillo, New Leon, Mexico; April, 1853. Lieut. Couch, 144.

Only seen on the eastern mountain slopes near Boquillo. In the forests it was found busily seeking its food among the limbs of the largest trees, quite lively, and shy.—(Couch.)

74. PYRANGA AESTIVA, Vieillot. (p. 301.)—Summer Red Bird.

8265 and 8266 ♀. San Antonio, Texas. J. H. Clark.—4071 ♀. Brownsville, Texas; February 11. Lieut. Couch.—4072 ♂. New Leon, Mexico. Do.—4070 ♀. Rio Nasas, Mexico; June, 1853, do.

Usually seen in parties of two or three, and not unfrequently in company with birds differing from it in type and habits. Occurring most abundantly in the thicker vegetation of the Rio Grande valley. In summer season its principal food is the fruit of the Opuntia. Flies but a short distance at a time for the most part; prefers clumps of chapparal, and does not habitually frequent the ground.—(Clark.)

From Texas to Durango. No peculiar habits observed.—(Couch.)

75. HIRUNDO HORREORUM, Barton. (p. 308.)—Barn Swallow.

3956. San Diego, New Leon, Mexico; August 1, 1853. Lieut. Couch, 124.

76. HIRUNDO BICOLOR, Vieillot. (p. 310.)—White-bellied Swallow.

4663 ♂. Matamoras, Mexico. Lieut. Couch.

77. HIRUNDO THALASSINA, Swainson. (p. 311.)—Violet Green Swallow.

3954 ♂, and 3955 ♂. Saltillo, Mexico; spring of 1853. Lieut. Couch, 229 and 230.

78. COTYLE SERRIPENNIS, Bonap. (p. 313.)—Rough-winged Swallow.

3957 ♀. New Leon, Mexico; April, 1853. Lieut. Couch, 131.

79. PROGNE PURPUREA, Bon. (p. 314.)—Purple Martin.

3952 ♂. Coahuila, Mexico; May, 1853. Lieut. Couch, 231.

80. AMPELIS CEDRORUM, Baird. (p. 318.)—Cedar Bird.

3958 ♀. Tamaulipas, Mexico; March 20, 1853. Lieut. Couch, 89.—3959. New Leon, Mexico; April, 1853; do. 155

81. PHAINOPEPLA NITENS, Sclater. (p. 320.)

8273 ♀. Fort Yuma; November 25. A. Schott. 27.—8279. Fort Yuma. A. Schott.—4591. Gila river, N. M. A. Schott. 27.—4592 ♀. Gila river, N. M. A. Schott. 22.—4564. Cook's Well, Cal. A. Schott, 21.

Very common at Los Nogales.—(Kennerly.)

82. COLLYRIO EXCUBITOROIDES, Baird. (p. 327.)—White-rumped Shrike.

8718. San Elizario, Texas; December 15. J. H. Clark.—8716. El Paso, Texas, do.—4572. Gila river N. M. A. Schott.—8720. Fort Yuma, Cal. do.

Shy, and not very abundant; flies a long distance at a time when pursued. Solitary; occasionally in pairs. It alights on topmast branches, usually resting quietly in that position till frightened off.—(Clark.)

83. VIREO OLIVACEUS, Vieill. (p. 331.)—Red-eyed Fly-catcher.

6813 ♂. Devil's river, Texas. J. H. Clark, 16.

84. VIREO FLAVOVIRIDIS, Cassin. (p. 332.)

3776 ♂ and 3977 ♂. Monterey, Mexico. Lieut. Couch.

85. VIREO BELLI, Aud. (p. 337.)—Bell's Vireo.

6817 ♂. Western Texas. J. H. Clark.

86. VIREO ATRICAPILLUS, Woodh. (p. 337.)—Black headed Fly-catcher.

6818 ♂. San Pedro river, Texas. J. H. Clark, 21.

87. VIREO NOVEBORACENSIS, Bonap. (p. 338.)—White-eyed Vireo.

3972. Brownsville, Texas. Lieut. Couch.

This little bird fills the chapparal with his melodious song.—(Couch.)

88. VIREO HUTTONI, Cassin. (p. 339.)—Hutton's Fly-catcher.

3973 ♂. Monterey, Mexico. Lieut. Couch.

Very rare; found in the mountains. Has a soft delicate note.—(Couch.)

89. MIMUS POLYGLOTTUS, Boie. (p. 334.)—Mocking Bird.

4017. Brownsville, Texas. Lieut. Couch, 2.—8163, 8166. Eagle Pass, Texas, 1852. A. Schott.—4561. Fort Yuma, Cal. A. Schott, 26.—8165? Gila river. December, 1854, do.

Besides being the most musical, is the most conspicuous and most generally distributed bird in Texas. Equally abundant in the valleys or on the plains. Unlike other thrushes, these birds are always disposed to fight, not only among themselves, but attacking indiscriminately all others that come in their way. The nest is made of very coarse sticks, rather loosely laid, in some quiet place not far from the ground. Maximum number of eggs, five. More than one pair frequently seem to have an interest in the same nest.—(Clark.)

More or less abundant to the Sierra Madre.—(Couch.)

90. OREOSCOPTES MONTANUS, Baird. (347.)—Mountain Mocking Bird.

4019 and 4018 ♀. Tamaulipas, Mexico. Lieut. Couch, 108.—8132 ♀ and 8133 ♂. March, 1855. Dr. Kennedy, 50 and 49.—4562. Gila river, N. M. A. Schott, 39.

Seems to live among the low bushes and on the ground—quiet and sparrow-like in its habits.—(Couch.)

In habits this bird very closely resembles the common robin (*Turdus migratorius.*) Frequently observed in pairs, running rapidly over the ground, actively searching for insects.—(Kennerly.)

91. HARPORHYNCHUS LECONTII, Bonap. (p. 350.)—Leconte's Mocking Bird.

PLATE XII.

Found at Fort Yuma.

92. HARPORHYNCHUS CURVIROSTRIS, Cabanis. (p. 351.)

PLATE XIII.

7101. Eagle Pass, Texas. A. Schott.—7200 ♂. Ringgold Barracks, Texas. J. H. Clark.

The nest is similar to that of the *Mimus polyglottus*, but finer and more compact, and is oftener found among the Opuntia than elsewhere. Quiet and rather shy, keeping in the clumps of the chapparal; makes much noise in flying for a bird of its size. My tent at Ringgold Barracks was pitched under a *Como* tree, in which there was a nest of these birds. At first they were shy, and were disposed to abandon their nest, but soon became accustomed to their new neighbor, and went on in their nidification.

This nest seems to have been judiciously selected; for during this season the *Como* black fruit, somewhat in size and shape of a thimble, with a pleasant milky pulp, constituted their principal food. Eggs are finely speckled; the maximum number, five.—(Clark.)

From Brownsville to Durango; at the former place it had paired in February; was exceedingly tame and gentle in its habits. Its note or song is exceedingly melodious and withal very attractive; perched on the topmost bough of the sweet flowering Mimosa tree, the male, in the presence of his consort, pours forth a volume of most enchanting music.—(Couch.)

93. HARPORHYNCHUS LONGIROSTRIS, Cabanis. (p. 352.)

PLATE XIV.

4016. ♂. Brownsville, Texas. Lieut. Couch.—8139. Lower Rio Grande. A. Schott.

94. CAMPYLORHYNCHUS BRUNNEICAPILLUS, Gray. (p. 355.)

7148. Ringgold Barracks, Texas. J. H. Clark.—3966. ♂. Monterey, Mexico. Lieut. Couch.—7151. Fort Yuma, California. A. Schott.

Has apparently a rich powerful song. Nest very large, composed of grass lined with feathers, built among the prickly pear.—(Couch.)

95. CATHERPES MEXICANUS, Baird. (p. 356.)—White-throated Wren.

3968. Patos, Coahuila, Mexico. Lieut. Couch, 236.—3969. ♂. New Leon, Mexico. Lieut. Couch, 175.

Found among the precipitous cliffs of the Sierra Madre cañons, away from the haunts of men, seeking its food and probably making its nest in the rocky crevices generally beyond the possibility of access. Its note is rich and clear, making the passes echo and re-echo with its silvery melody. Here it was never seen away from its rocky home, but at Patos, in Coahuila, a specimen was taken in the suburbs of the city.—(Couch.)

96. SALPINCTES OBSOLETUS, Cab. (p. 357.)—Rock Wren.

7158 ♀. El Paso, Mexico, December, 1854. Dr. Kennerly, 15.—7162 ♂ do., May, 1852; do.—3967, Patos, Coahuila. Lieutenant Couch, 238.

Found among the low dwarf bushes of the sandstone ranges near Patos, Coahuila; general habits sparrow-like; has the grating wren noise, together with a varied song of great sweetness.—(Couch.)

Found in the vicinity of the Rio Grande among the bushes. Flight short, the bird generally soon alighting on the ground and running off very rapidly.—(Kennerly.)

97. THRYOTHORUS BERLANDIERI, Couch. (p. 362.)

7122 ♀. Boquillo, New Leon, April, 1853, (142,) and 7121, San Diego, Mexico, March, 1853, 123, Lieutenant Couch.

98. THRYOTHORUS BEWICKII, Bonap. (p. 363.)—Bewick's Wren.

7127. Los Nogales, Mexico, January, 1855, Dr. Kennerly—7131 ♀, Devil's river, Texas, J. H. Clark, 18.—7130, New Leon, Mexico, April, 1853, Lieutenant Couch, 158.

At Santa Rosalio (41) the bird was found early in March flying among the low prickly pear seeking its food. The natives told me it laid its eggs inside of their cabins under the rafters, wherever it could find a place to deposit eggs, without the trouble of making a nest.

At Guaypuco, New Leon, (158,) had a nest in the thatched roof quite elaborately constructed. Its varied song was one of the sweetest I had heard in the country.—(Couch.)

99. TROGLODYTES PARKMANNI, Aud. (p. 367.)—Parkmann's Wren.

7193 ♂. Charco Escondido, Mexico. Lieutenant Couch, 76.

100. POLIOPTILA CAERULEA, Sclater. (p. 380.)—Blue-gray Fly-catcher.

7193 ♀ and 7194 ♀an Mountains, Texas, J. H. Clark.—3985 ♂ and 3984 ♀. Org Tamaulipas, Mexico. Lieutenant Couch.

101. POLIOPTILA PLUMBEA, Baird. (p. 382.)

7187 ♀. Boca Grande, Mexico, March, 1855. Dr. Kennerly, 38.

When the specimen was procured only two were found together, a mile or more from the river, on the hills among the bushes Very active and restless, continually in motion.—(Kennerly.)

102. LOPHOPHANES ATRICRISTATUS, Cassin. (p. 385.)—Black crested Tit.

3974 ♂. New Leon, Mexico, Lieutenant Couch, 96, and 3975 ♀, do., 97.

This species was found very common from near China, on the San Juan, into the Sierra Madre. It is a lively bird, with a most perfect whistle of one note.—(Couch.)

103. LOPHOPHANES WOLLWEBERI, Bon. (p. 386.)

Plate XV, fig. 1.

6794 ♀. Copper Mines. J. H. Clark, 3.

104. PSALTRIPARUS MELANOTIS, Bon. (p. 396.)—Black-cheeked Tit.

Plate XV, fig. 3.

Said to occur on the Rio Grande of Texas.

105. PAROIDES FLAVICEPS, Baird. (p. 400.)

Plate XV, fig. 2.

6774. El Paso, December 26, 1854. Dr. Kennerly, 24.—4015. Saltillo, Mexico. Lieut. Couch, 218.

Found in the vicinity of the Rio Grande; very wild, and flying rapidly and far before alighting. Frequenting the low mesquite and Larrea bushes on the hill sides.—(Kennerly.)

106. EREMOPHILA CORNUTA, Boie, var. CHRYSOLAEMA, Wagler. (p. 403.)—Sky Lark.

8726. Frontera, May, 1852. C. Wright.—4097 ♂, Saltillo, Mexico, May, 1853. Lieutenant Couch.

Called by the Mexicans *llaneros*, meaning a bird that lives on the plains; it is only seen on the open and arid plains; by June it is in flocks.—(Couch.)

107. CARPODACUS FRONTALIS, Gray. (p. 415.)—House Finch.

6426 ♂. Frontera, Mexico, May 6. C. Wright.—4084 ♀ and 4085, Monterey, Mexico, April, 1853. Lieutenant Couch, 186.

First seen in the city of Monterey, where it lived in security, its lively note and social disposition making it a welcome visitor in the gardens of the city.

It was found in considerable numbers in the vicinity of dwellings throughout the passes of the Sierra Madre. In the courtyard of the Hotel de Monterey I noticed that it often came to drink from the water bucket by the well.—(Couch.)

108. CHRYSOMITRIS MEXICANA, Bonap. (p. 423.)—Mexican Goldfinch.

Plate XVI, fig. 1.

4077. Santa Catarina, New Leon, Mexico, April, 1853. Lieutenant Couch, 183.—6396 ♀. Agua Nueva, Coahuila, Mexico, May, 1853. Lieutenant Couch, 234.—4078 ♀ Parras, Mexico, June 1, 1853, do.

This little bird was only seen in the vicinity of water, generally among the branches of the ornamental trees of the almedas and gardens.—(Couch.)

109. PASSERCULUS ALAUDINUS, Bonap. (p. 446.)

4340. Brownsville, Texas, February, 1853. Lieutenaat Couch.—4341 ♂ and 4344. Tamaulipas, Mexico, March, 1853, do.

110. POOECETES GRAMINEUS, Baird. (p. 447.)—Grass Finch.

4343 ♂. Tamaulipas, Mexico, August, 1853. Lieutenant Couch, 56.—4344 ♀, do., March, 1853, 44.—6220. Boca Grande, Mexico, March, 1855. Dr. Kenuerly, 37.—6221. Espia, Mexico, do.

Frequently observed in flocks on the hill sides, feeding among the Larrea, Obione, and other bushes; rarely seen in the immediate vicinity of the river.—(Kennerly.)

111. COTURNICULUS PASSERINUS, Bonap. (p. 450.)—Yellow-winged Sparrow.

6333. Los Nogales, Mexico, June, 1855. Dr. Kennerly, 85.

Not often seen; generally in small flocks of four or five.

112. CHONDESTES GRAMMACA, Bonap. (p. 456.)—Lark Finch.

4083 ♀. New Leon, Mexico. Lieutenant Couch, 147.—4590. Colorado river, California, December 30, 1854. A. Schott, 31.

Found in the underbrush; song varied and extremely pleasing, equal to that of the canary, with one or two rare notes.—(Couch.)

113. ZONOTRICHIA LEUCOPHRYS, Swains. (p. 458.)—White-crowned Sparrow.

4080 ♂ and 4082. Tamaulipas, Mexico. Lieutenant Couch, 48.—4081 ♀. Brownsville, Texas, Lieutenant Couch, 4.—6195. Frontera, Texas, May 4. A. Schott.

In flocks, at Charco Escondido, March, 1853.—(Couch.)

114. ZONOTRICHIA GAMBELII, Gambel. (p. 460.)

6200. San Elizario, Texas, December, 1854. Dr. Kennerly, 9.

Very often observed in the valleys of the Rio Grande, Corralitos, and Janos rivers. It apparently prefers the vicinity of settlements, where it was always seen in greater numbers than elsewhere.—Kennerly.

115. POOSPIZA BILINEATA, Sclater. (p. 470.)—Black-throated Sparrow.

4088 ♀. Tamaulipas, Mexico, March, 1853. J. H. Clark, 77.—6320. Ringgold Barracks, Texas, July, 1853, do.—6317 and 6319 ○. Frontera, Texas. J. H. Clark.—6318 ♀ Frontera. May 5, 1852, do.—6316 ♂. El Paso, New Mexico, December, 1854. J. H. Clark, 17.—6315. Boca Grande, New Mexico, March, 1855. Dr. Kennerly, 42.

Abundant and widely distributed. I found them on the lower Rio Grande, but more abundantly in the middle of the continent. Prefer habitually the stunted and sparse vegetation of the sand hills and dry plains to the cotton-wood groves and willow thickets of the river valleys, where, indeed, they were never seen. They would certainly be very inconspicuous, as well from their color and habits as from size, if it were not that the male occasionally perches himself on some dry stick or topmost branch and pours forth a continuous strain of music. In some of the more barren regions, where the Creosote plant and stunted forms of the mesquite constitute the only vegetation, they may be said to be the representatives of the feathered tribes.—(Clark.)

Sparrow-like in its habits; has a low note, and keeps in close attendance upon its mate.—(Couch.)

Found on the hill sides adjacent to the Rio Grande and Corralitos rivers, feeding among the low bushes. It was quite wild; flying very rapidly for a short distance, alighting on a bush, and, immediately descending to the ground, would run off very swiftly. Two or more generally observed together.—(Kennerly.)

116. SPIZELLA PALLIDA, Bonap. (p. 474.)—Clay-colored Bunting.

4091. Tamaulipas, Mex., March, 1855. Lieut. Couch.

117. SPIZELLA BREWERI, Cassin. (p. 475.)—Brewer's Sparrow.

6357. Boca Grande, Mex., March, 1855. Dr. Kennerly, 40.—6356 ♀. El Paso, Texas, May 4, 1852. C. Wright.

Found in flocks, frequenting the hills in the vicinity of the river. Often associated with the larger sparrows.—(Kennerly.)

118. SPIZELLA ATRIGULARIS, Baird. (p. 476.)—Black-chinned Sparrow.

Plate XVII, fig. 1.

4335 ♂. Agua Nueva, Coahuila, Mex., May, 1853. Lieut. Couch.

Found in flocks, May, 1853. Mountains of Agua Nueva, Coahuila, Mex., 223.—(Couch.)

119. MELOSPIZA MELODIA, Baird. (p. 477.)—Song Sparrow.

6226? Boca Grande, Mex., March, 1855. Dr. Kennerly, 39.

Generally found in the immediate vicinity of the river where the bushes were thickest and most impenetrable.—(Kennerly.)

120. MELOSPIZA LINCOLNII, Baird. (p. 482.)—Lincoln's Finch.

4090 ♂. Tamaulipas, Mex., March, 1853. Lieut. Couch, 55.—4089. Brownsville, Texas, ditto, 7, and 4090, ditto 9.

121. PEUCAEA CASSINII, Baird. (p. 485.)

6327. Los Nogales, Mex., June, 1855. Dr. Kennerly.

122. EMBERNAGRA RUFIVIRGATA, Lawrence. (p. 487.)

Plate XVII, fig. 2.

6246. New Leon, Mex. Lieut. Couch.—6247. Ringgold Barracks, Texas. J. H. Clark.

123. CALAMOSPIZA BICOLOR, Bonap. (p. 492.)—Lark Bunting.

6301 and 6302. Sonora, Mex., Dr. Kennerly.—6303 ♂ and 6304 ♀. Espia, Mexico, March, 1855. Dr. Kennerly.

Sometimes occurring in flocks of hundreds; the greatest numbers were seen near Presidio del Norte. Great varieties of plumage were observed in the same flock. Seeds appeared to constitute their food. Very simultaneous in all their movements, never having observed a straggler remaining behind after the flock had started; they are the most absolutely gregarious birds I ever met with.—(Clark.)

Observed in the valley of the river early in the morning in very large flocks. During the greater part of the day they feed on the hills among the bushes. When on the wing they keep very close together, so that a single discharge of small shot will sometimes bring down twenty or thirty.—(Kennerly.)

124. GUIRACA CAERULEA, Swainson. (p. 499.)—Blue Grosbeak.

4092 ♂ and 4093 ♀. New Leon, Mex., April, 1853. Lieut. Couch, 146.—6384 ♂. Eagle Pass, Tex. A. Schott.—6382 ♂. Frontera, Mex., May, 1853. C. Wright.—6383 ♀. Zoquito, Mex. J. H. Clark.—6381. Los Nogales, Mex., June, 1855. Dr. Kennerly, 80.

First seen near Monterey. Male preceded the female; exceedingly tame.—(Couch.)

Not often seen, but when observed generally solitary, preferring the dark ravines and cañons on the mountain sides.

125. CYANOSPIZA PARELLINA, Baird. (p. 502.)

PLATE XVIII, Fig. 1.

4076. Sierra Madre, New Leon, Mex., April, 1853. Lieut. Couch, 154.

126. CYANOSPIZA VERSICOLOR, Baird. (p. 503.)

PLATE XVIII, Fig. 2.

4075 ♂. Boquillo, New Leon, Mex. Lieut. Couch, 151.

127. CYANOSPIZA CIRIS, Baird. (p. 503.)—Painted Bunting.

6272 ♂, 6273 ♀. San Antonio, Tex. J. H. Clark.—6274 ♀ and 6275 ♀. San Pedro, Tex. J. H. Clark.

This bird diminishes in number as we proceed westward. Their nest is built of very fine grass, in low bushes, and resting in the crotch of the twigs. Males were never seen about the nests; but the females are so gentle as to allow themselves to be taken off the nest, which was deliberately done on more than one occasion. The eggs are of blue, usually five in number. The male is most always seen alone, flying a long distance at a time for so small a bird.—(Clark.)

Shot among the low hedges in the suburbs of Pesqueria Grande.—(Couch.)

128. SPERMOPHILA MORELETII, Pucheran. (p. 506.)

PLATE XVI, Figs. 2, 3. (Male and female.)

4096 ♂. San Diego, New Leon, Mex., March, 1853. Lieut. Couch, 113.—4095 ♂? Monterey, Mex., April, 1853. Lieut. Couch, 163.

Was noticed busily but quietly seeking its food among the blossoms of the sweet mimosa. No note except a lively chirp.—(Couch.)

129. PYRRHULOXIA SINUATA, Bonap. (p. 508.)

4027 ♂. New Leon, Mex., May, 1853. Lieut. Couch, 209.—4028 ♂ and 4029 ♀. 47 and 59.—6366 ♀ and 6367. Ringgold Barracks, Tex., July, 1853. A. Schott.—6368. El Paso, Texas, Jan., 1855. Dr. Kennerly.

When first seen in March, (Tamaulipas,) it was in flocks, very shy, and quite difficult to approach. Not much in the open fields, but preferring the vicinity of fences and bushes; often seen in company with C. virginianus.—(Couch.)

We found this bird quite abundant in the vicinity of El Paso, but did not observe it elsewhere. It kept generally in flocks of from three to six, frequenting the hedges and fruit trees in the immediate vicinity of the houses. When approached it became very restless, flying from branch to branch and from tree to tree, uttering with great vehemence its peculiar note.—(Kennerly.)

130. CARDINALIS VIRGINIANUS, Bonap. (p. 509.)—Red Bird.

4030 ♂. Feb., 1853. Lieut. Couch, 23.—4032 ♀. Brownsville, Texas. Lieut. Couch, 12.—4031. New Leon, Mexico, April, 1853. Lieut. Couch, 127.

More or less common among the Sierra slopes of New Leon and Coahuila. Great numbers in Tamaulipas.—(Couch.)

131. PIPILO MEGALONYX, Baird. (p. 515.)

4603. Heights of San Pasqual. A. Schott, 12.—4042 ♀. Saltillo, Mex. Lieut. Couch.—6732 ♀. Copper Mines, N. Mex. J. H. Clark.

A shy, quiet bird, in woody places.—(Couch.)

132. PIPILO ABERTII, Baird. (p. 516.)

4604. Fort Yuma, Cal. A. Schott.—4578. Colorado river, Cal. Do.

133. PIPILO MESOLEUCUS, Baird. (p. 518.)

6834 ♂. Santa Catarina, Mex. April, 1853. Lt. Couch.—6835 ♀. 6828. Copper Mines, New Mex. J. H. Clark, 5.—6830. Los Nogales, Mex. June, 1855. Dr. Kennerly.

Was met in abundance in the deep valleys or cañons of the Copper Mine region; almost always in or about the thick clumps of bushes, several in company; makes less noise in scratching among leaves for food than the eastern species, nor is it so active. It is gentle, however, and easily approached.—(Clark.)

Not very common, preferring the dense bushes in the valleys. When approached it becomes very restless, flying from bush to bush, accompanying its motions with their peculiar notes.—(Kennerly.)

134. PIPILO CHLORURA, Baird. (p. 519.)—Blanding's Finch.

4609. Colorado river, New Mex. April 10, 1355. A. Schott, 60.—6242. San Elizario, Tex. December 16, 1854. Dr. Kennerly, 23.—6243. Eagle Pass, Tex. Fall of 1852. A. Schott.

A specimen was procured with some difficulty. For several successive days it was found in the same place, occupying a small clump of very thick weeds. When aroused, which was only accomplished with some effort, its flight was short, rapid and irregular. Its motions on the ground were very awkward.—(Kennerly.)

135. MOLOTHRUS PECORIS, Swains. (p. 524.)—Cow Bird.

8759. Eagle Pass, Tex. A. Schott.—8761. Los Nogales, Mex. Dr. Kennerly, 82.—4580, 4585, and 4582. Fort Yuma, Cal. A. Schott, 43, 42.—4584. Gila river, New Mex. December 6, 1854. Do. 28.

Quite common at various points on the route. Very tame, feeding in large flocks around the camp, and among the wagons and tents. Sometimes following the herd of mules, making themselves very familiar with them by perching in numbers sometimes on their backs. So tame are they that the herders often indulged in the cruel sport of killing them with their whips.—(Clark.)

136. AGELAIUS PHOENICEUS, Vieillot. (p. 526.)—Swamp Blackbird.

4048 ♀. Brownsville, Tex. February 11, 1853. Lt. Couch, 20.—4049 ♂ and 4047 ♀? New Leon, Mex. March, 1851, and April, 1853. Lt. Couch, 170 and 182.—4050. Saltillo, Mex. May, 1853. Do. 17.—8591. San Elizario. December, 1854. Dr. Kennerly, 7.—8573. Espia, Mex. Dr. Kennerly, 45.

More or less common, to Durango, generally in the vicinity of ranches and villages; but in the lower Bolson de Mapime it makes its home in the pasturage of those natural meadows.—(Couch.)

Quite common in this locality, going in flocks, feeding in the grain fields and about the settlements. Observed also at Espia, and at Janos was sometimes found in company with the saffron-headed blackbird, (*Agelaius xanthrocephalus.*)—(Kennerly.)

137. AGELAIUS GUBERNATOR, Bon. (p. 529.)—Red-shouldered Blackbird.

4599? Colorado river, Cal. A. Schott, 50.—4600? and 4598? Do.

138. AGELAIUS TRICOLOR, Bon. (p. 530.)—Red and White-shouldered Blackbird.

4601. Colorado river, Cal. December, 1854. Dr. Kennerly, 19.

139. XANTHOCEPHALUS ICTEROCEPHALUS, Baird. (p. 531.)—Yellow-headed Blackbird.

4045 ♂. New Leon, Mex. May, 1853. Lt. Couch.—4046 ♀. Do.—8570 ♂. El Paso. A. Schott.

This, mingled with two or three of its congeners, was always met with in flocks. The *Quiscalus macrourus* is an occasional companion, but its unwieldly tail and heavy flight prevents it from keeping up. More abundant in the vicinity of the coast than in the middle of the continent. There was a roost of these birds on an island in a laguna near Fort Brown. Towards sunset, and from that time till dark, they could be seen approaching this spot from all quarters. It took them about an hour to get settled down, till which time they kept up a constant chattering and change of place. I saw another of these roosts on an island of the Rio Grande, near its mouth, where the willows were so thick as to intercept vision, but each one seemed bending under the support of at least half dozen blackbirds.—(Clark.)

Found in company with the grakle and cow blackbird; note loud.—(Couch.)

Very common near Janos, and also near Santa Cruz, Sonora. Observed at the former place in the month of April going in large flocks; sometimes associated with *Agelaius phoeniceus*. Quite domestic in their habits, preferring the immediate vicinity of the houses, and often feeding in the yards along with the domestic fowls.—(Kennerly.)

140. STURNELLA NEGLECTA, Aud. (p. 537.)—Western Lark.

8611. Matamoras. Lt. Couch.—4064 ♀. Coahuila, Mex. Do.—8613. San Elizario, Tex. December, 1855. Dr. Kennerly, 19.—8614 ♂. Espia, Mex. March, 1855. Dr. Kennerly.—8615. Fort Yuma, Cal. November, 1854. A. Schott.—4573. San Diego, Cal. A. Schott.

What I supposed to be the same species was found from the Rio Grande to the high bottoms in the lower Balson de Mapinri. Its note is highly musical, contending with the *mocking bird* for a supremacy in song.—(Couch.)

141. ICTERUS AUDUBONII, Giraud. (p. 542.)—Audubon's Oriole.

4063 ♂. Charco Escondido, Tamaulipas, Mex. May. Lt. Couch, 64.—4062 ♀. Do. 63.—4059. Matamoras, Mex. Dr. Berlandier.—6713. Ringgold Barracks, Tex. J. H. Clark.

Common from the lower Rio Grande to the Sierra Madre. A strong mutual attachment shown by the sexes. It has a soft melancholy song of the notes *peut pou it*, the sweetness of which renders it a favorite as a cage bird.—(Couch.)

142. ICTERUS PARISORUM, Bonap. (p. 544.)

PLATE XIX, Fig. 1.

4056 ♂ and 4057 ○ ♂. Santa Catarina, New Mex. April, 1853. Lt. Couch.

First seen in the vicinity of Monterey; generally secluded, its song consisting of three or four notes; is rich and melodious.—(Couch.)

143. ICTERUS WAGLERI, Sclater. (p. 545.)

PLATE XIX, Fig. 2.

4058 ♂. Saltillo, Coahuila, Mex. May, 1853. Lt. Couch.

Believed to be the only one of the species seen; this was in Coahuila, at the ranche of Ojo Caliente, on a hot spring; quite shy and difficult to approach. Like the other Orioles, it appeared to be fond of the palm or Spanish bayonet.—(Couch.)

144. ICTERUS CUCULLATUS, Swains. (p. 546.)—Hooded Oriole.

4067 ♂. Charco Escondido. Tamaulipas, Mex. March, 1853. Lt. Couch, 83.—4066 ♂. Tamaulipas, do. 91.—4068 ♂. Do. April. Do. 159.—4069 ♀. Do. March, 1853. Do. 90.

Nest generally on, or often under, the top of the Spanish bayonet. Common in Tamaulipas and New Leon.—(Couch.)

145. ICTERUS SPURIUS, Bon. (p. 547.)—Orchard Oriole.

6707 ♀, 6708 ♀, 6712 ♂, and 6710. Western Texas. J. H. Clark.

146. ICTERUS BALTIMORE, Daudin. (p. 548.)—Baltimore Oriole.

6714. San Antonio, Texas. J. H. Clark.

Numbers of these were seen nesting in the mesquite on the prairies, at which time they were very musical, and having sometimes as many as three nests in the same tree; the nests were built of fine grass, in the tops of the branches, and interwoven among the leaves.—(Clark)

147. ICTERUS BULLOCKII, Bon. (p. 549.)—Bullock's Oriole.

6727. Guadalupe cañon. 1855. Dr. Kennerly, 68.—6723. Eagle Pass. A. Schott.

In passing through the Guadalupe cañon this bird was often seen, but at no other point on the route was it observed. It seemed to prefer the low bushes on the hill sides to the large trees. In its motions it was quick and restless, passing rapidly from bush to bush.—(Kennerly.)

148. SCOLECOPHAGUS CYANOCEPHALUS, Cab. (p. 552.)—Brewer's Blackbird.

8712. Eagle Pass, Tex. A. Schott.—8713. Santa Rosalia, Mex. Lt. Couch.

Lives about the ranches and cattle yards.—(Couch.)

149. QUISCALUS MACROURA, Swains. (p. 554.)—Long-tailed Grakle.

PLATE XX.

8553. Texas. A. Schott.—8551 and 8552. Eagle Pass, Tex. Do.

The plate represents the details of external form, of natural size.

150. QUISCALUS MAJOR, Vieill. (p. 555.)—Boat-tailed Grakle.

4044? Brownsville, Tex. Lt. Couch, 6.

151. CORVUS CARNIVORUS, Bartram. (p. 560.)—American Raven.

4563. Jamacha Ranch, Cal. A. Schott, 9.—10298. ♂. Espia, Sonora. Dr. Kennerly, 51.

Observed everywhere throughout the country. Flocks of them follow the train from point to point. Not at all shy, but often coming into the camp in search of food.—(Kennerly.)

152. CORVUS CRYPTOLEUCUS, Couch. (p. 565.)—White-necked Crow.

10300. Janos, Mex. April, 1855. Dr. Kennerly, 64.—4118 ♀. Charco Escondido. May, 1853. Lt. Couch.

Does not seem to possess the cunning or wariness of its congeners. Found most abundantly about watering places; not habitually in great flocks, though at the head of the Limpia many were congregated and flying about the face of an immense rocky mountain wall, where they were probably nesting. Their note is coarse and less shrill than the common crow. Met with a nest in an arborescent cactus?—(Clark.)

Found in small numbers in eastern Tamaulipas, generally near ranches.—(Couch.)

Not very common, and when seen generally associated with the larger species of the same genus.—(Kennerly.)

153. CYANOCITTA CALIFORNICA, Strickl. (p. 584.)—California Jay.

4565. San Pasqual, Cal. A. Schott, 13.—8461. San Felipe, Cal. A. Schott.

154. CYANOCITTA WOODHOUSII, Baird. (p. 585.)—Woodhouse's Jay.

PLATE XXI.

Near Copper Mines.

At the Copper Mines a great many jays of this and allied species were seen, usually feeding, in parties of a dozen or more, on the piñoles and acorns. The harsh, disagreeable note of one of these wary birds is the signal of alarm for all the rest; even in their undisturbed course of feeding they go over a great deal of ground, the one in the rear advancing in front of his file leader, all the while keeping up their grating music, and thus each knowing the whereabouts of the other.

155. CYANOCITTA SORDIDA, Baird. (p. 587.)

PLATE XXII, Fig. 1.

8469. ♂. Copper Mines, N. Mex. 1851. J. H. Clark, 8.

The figure is taken from an adult specimen received from Mexico, No. 8469 being immature.

156. CYANOCITTA ULTRAMARINA, Strickl. (p. 588.)—Ultramarine Jay.

PLATE XXII, Fig. 2, (bill and tail.)

4112 ♂. Monterey, Mex. Lt. Couch, 156.—4113 ♂. April, 1853. Do. 157.

Found from below Monterey west to Parras. Gregarious; jay-like in habits; three or four of them will keep a forest in an uproar. Near Guopuco a large snake (*Georgia obsoleta*) was seen, pursued by three or four of this species. The reptile was making every effort to escape from their combined attacks, and would no doubt have been killed had they had fair play. The cause of so much spite against him was discovered when, upon opening his stomach, three young, two-thirds grown, of this species was found.—(Couch.)

157. XANTHOURA LUXUOSA, Bonap. (p. 589.)—Rio Grande Jay.

8365. Rio Grande, Tex. Oct. 2, 1855. A. Schott.—8357. Matamoras. Dr. Berlandier.—4052 ♂. New Leon, San Diego. March, 1853. Lt. Couch.

Eats seeds and insects.—(Couch.)

158. PSILORHINUS MORIO, Gray. (p. 592.)

4116 ♂ and 4117 ♀. Boquillo, Mex. Lieut. Couch, 140.—4118. San Diego, Cal. Do. 109.—4114 ♀. China, N. Leon, Mex. Do. 98.

Lives in forests of high trees. Jay-like in its habits; note loud, harsh; gregarious. Though making more noise than any other bird in its neighborhood, if one is brought down by a gun, the noise hushes them at once, and the rest move off in perfect silence.—(Couch.)

159. COLUMBA FASCIATA, Say. (p. 597.)—Band-tailed Pigeon.

8741. Los Nogales, Mex. July, 1855. Dr. Kennerly, 86.—4109 ♀. New Leon, Mex. Lt. Couch.

This beautiful bird was often observed in the valleys of the Santa Cruz and Los Nogales rivers, as well as among the oaks on the adjacent hills. In the month of June they were found in small flocks of four or five, rarely more. When flying, the wings often produced a flapping noise similar to that made by the domestic pigeon.—(Kennerly.)

160. COLUMBA FLAVIROSTRIS, Wagler. (p. 598.)—Red-billed Dove.

PLATE XXIII.

4111 ♂. New Leon, Mexico, March, 1853. Lieutenant Couch.—7098 ○. Rio Grande, Texas. A. Schott.

First seen in the thick woody bottoms of the San Juan, New Leon. Quite common, but secluded; flight rapid.—(Couch.)

161. MELOPELIA LEUCOPTERA, Bonap. (p. 603.)—White-winged Dove.

4107 ♀. Tamaulipas, March, 1853. Lieutenant Couch.

162. ZENAIDURA CAROLINENSIS, Bonap. (p. 604.)—Common Dove.

4102 ♂. Tamaulipas, Mexico. Lieutenant Couch, 42.—8754. Ringgold Barracks, July, 1853.

J. H. Clark.—8757. San Elizario, Mexico, December 14, 1854. Dr. Kennerly, 8.—4560 and 4559. Colorado river, California. A. Schott.

The vicinity of Ringgold Barracks seems to be a resort of many birds of this family, for the purpose of nesting. The luxuriant development of the opuntia and other vegetation equally as impassible afford at once the means of defence. Hundreds of at least a half dozen species may be seen in the evening watering on the banks of the river.—(Clark.)

In great numbers from the Rio Grande to beyond the Sierra Madre; generally near the ranches, though often in the forests. It seems to be inclined to court society, probably for protection and food.—(Couch.)

Very abundant in the vicinity of San Elizario, going in large flocks, and feeding in the wheat and corn fields. Observed also as far west as Santa Cruz, Sonora.—(Kennerly.)

163. SCARDAFELLA SQUAMOSA, Bonap. (p. 605.)—Scaly Dove.

4110 ♀. Cadereita, New Leon, Mexico. April 18, 1853. Lieutenant Couch, 128.

164. CHAMAEPELIA PASSERINA, Swain. (p. 606.)—Ground Dove.

4105. Matamoras, Mexico. Dr. Berlandier.—4104 ♀ and 4103 ♂. Tamaulipas. Lieutenant Couch, 57 and 58.

Generally found in the forests or open fields at a distance from dwellings; flies low and for short distances, though keeping generally on the ground.—(Couch.)

165. ORTALIDA McCALLI, Baird. (p. 611.)—Chiacalacca.

4106 ♂. Boquilla, New Leon, spring of 1853. Lieutenant Couch, 137.

Does not occur higher up the Rio Grande than the vicinity of Ringgold Barracks. Inhabits the densest chapparal, which it never quits; inactive, and for the most of the time sitting about in flocks or gangs in these thickets feeding on leaves. Its Mexican name, *Chikilaka*, is, without doubt, derived from the noise with which at times it makes the valleys ring again, and may be pretty well imitated in kind, but not in strength, by putting the most stress upon the last two syllables. No sooner does one take up his song than others chime in from all quarters, till, apparently exhausted, the noise gradually dies off into an interlude, but to be again renewed. These concerts take place in the morning and evening. They are gentle and easily tamed, and are said to cross with the common dunghill fowl.—(Clark.)

Gregarious. In part or wholly seeks its food on trees.—(Couch.)

156. ORTYX VIRGINIANUS, Bonap. (p. 640.)—Partridge.

Eastern Texas.

167. ORTYX TEXANUS, Lawrence. (p. 641.)—Texas Quail.

PLATE XXIV.

9354. Devil's river, Texas, November, 1854. Dr. Kennerly, 20.—9349 ♂. Laredo, Texas, J. H. Clark.—4101. Matamoras. Lieutenant Couch.—4099 ♂. New Leon, Mexico. Lieutenant Couch.—4098. Do., May, 1853. Do., 208.

Not seen in abundance west of the valley of the Pecos, where, as well as in all southwestern Texas, they are very abundant. They are as much like the Virginia quail in habits as they are in general appearance. Nothing short of direct comparison would satisfy me that they were specifically distinct. Its note, to my ear, was absolutely identical with that of the Virginia quail. Have often been a spectator of fights among the cocks.—(Clark.)

Observed everywhere in considerable numbers from the coast to the head of Devil's river, and also along the Pecos, but further west than this was not seen. In the open prairie lands great numbers were always found early in the morning in the road. In its habits it very closely resembles the common Virginia partridge—(Kennerly.)

168. LOPHORTYX CALIFORNICUS, Bonap. (p. 644.)—California Quail.

9396 ♂. Near San Diego. A. Schott.

169. LOPHORTYX GAMBELII, Nutt. (p. 645.)—Gambell's Partridge.

9362. San Elizario, Texas, December, 1855. Dr. Kennerly, 14.—9363, 9364, ♀. Do. 13 and 5.—9369 ♀. Colorado river, California. A. Schott.—9370 ♂, do. Dr. Kennerly.

This species was not met east of the valley of the Rio Grande, nor further south than Presidio del Norte. Unlike the *squamata*, it is very common for this species to sit on the branches of trees and bushes, particularly the male, where he bewails in notes most mournful the absence of his mate and other cares of life. They are so tame as to come about the Mexican towns, the inhabitants of which, though half starved, never think of making an effort to capture them. It inhabits only wooded and watered regions. I believe that they will take insects or berries, indifferently, which ever first falls in the way of an empty crop. In summer they make the patches of "*Solanum?*" their home, feeding on its quite palatable berries. Unlike the *squamata* and *massena*, this quail when flushed seeks trees and hides very successfully among the branches.—(Clark.)

Was not observed until we reached the valley of the Rio Grande, and not further west than San Bernardino, Sonora. Though closely resembling in its habits the scaly partridge, (*Callipepla squamata,*) and occupying the same districts in some instances, they were never observed together.—(Kennerly.)

170. CALLIPEPLA SQUAMATA, Gray. (p. 646.)—Scaled or Blue Partridge.

9381. ♀. San Pedro. J. H. Clark.—3999 ♂, New Leon, Mexico. Lt. Couch.

This quail does not occur on the grassy prairies near the coast. My first acquaintance with it was on Devil's river, where my attention was attracted by a very peculiar note, of which I started in pursuit, thinking the noise was made by some kind of squirrel. In the valley of the lower Rio Grande they were frequently met with in covies of a dozen or more. Their food on the prairies is doubtless insectivorous, while on the lower Rio Grande it was almost impossible to obtain a specimen whose bill was not stained with the fruit of the *Opuntia.* Not shy, and would rather get out of the way by running than by flying. At no time and under no circumstances do they alight in bushes or trees. Remains of nests show them to be mere scratches in the ground and very carelessly selected. Young were met with in June and July.—(Clark.)

This species was first seen about 60 leagues west of Matamoras, not until free from prairie and bottom land; it was occasionally noticed apparently associating with the *Oxtyx texana;* general habits similar to that bird.—(Couch.)

Found everywhere where there was permanent and fresh water, from Limpia creek, Texas, to San Bernardino, Sonora. Living on the mountain sides or on the hills among the low mesquite bushes and larrea; relying apparently more upon its legs than wings, ascending the most precipitous cliffs or disappearing among the bushes with great rapidity.—(Kennerly.)

171. CYRTONYX MASSENA, Gould. (p. 647.)—Massena Partridge.

9358. Turkey creek, Tex., Nov., 1854. Dr. Kennerly, 25.—9355. Laredo, Texas. J. H. Clark.—3998 ♂ New Leon, Mex., April, 1853. Lt. Couch.

Once on flushing a covy of *Ortyx texanus*, my attention was attracted by a bird that remained behind showing no inclination to follow the rest. It attempted to hide in the grass but not to fly, and on being shot proved to be a male *massena.*

It occurs in pairs or flocks, and when flushed it flies further than the Virginia quail, and does not lie so close. They may be approached within a few feet, and followed up, particularly when in pairs; running along before you like so many domestic fowls. It is quiet as well as retired; a subdued though sharp note is the only noise I ever heard it make, and that only when frightened. I have seen it pursued and all the barrels of a six-shooter fired at it without giving it alarm and finally forced to fly only by an attack of stones and clubs. It was first met in the neighborhood of San Antonio, and thence sparsely distributed, as an inhabitant both of prairies and mountains, as far westward as Sonora. It is a much wilder bird than the *squamata*; less conspicuous as also less noisy; and never seen in flocks, living about old camps, as is often the case with the latter. Its haunts are far removed from the habitation of man, and the indifference it sometimes manifests to his presence is due to its ignorance of his power and attributes. Though distributed over the same country as the *squamata*, it is not found in such barren regions as the latter frequently is—preferring those districts most luxuriantly covered with vegetation.—(Clark.)

First seen in the cañon Guapuco, 12 leagues south of Monterey; though rather shy, it seemed quite at home in the cultivated fields and stubbles of the ranches.—(Couch.)

This bird I have never seen further south in Texas than Turkey creek. In this vicinity it was very common, and also at various points thence to the Rio Grande In the valley of this river it is very rarely seen, giving way apparently to the Scaly and Gambel's partridges. West of the river it was very common as far as we travelled, wherever there was fresh and permanent water. In the valley of the Santa Cruz river, and among the adjacent hills, it was extremely abundant. In the months of June and July it was observed there, always in pairs; while in Texas, in the months of October and November, it was found in very large flocks, sometimes of various ages, from the very small and partly fledged, to the full grown bird. When hunted it hides itself very closely in the grass, and often I have known the Mexican soldiers in Sonora to kill them with their lances by striking them either while on the ground or just as they rise. Some of these men are very expert in this business, and will kill many in the course of a day's travel.—(Kennerly.)

172. GRUS CANADENSIS, Temm. (p. 655.)—Sand-hill Crane.

4623. Colorado river, Cal., February 19, 1855. A. Schott, 46.

173. DEMIEGRETTA RUFA, Baird. (p. 662.)—Reddish Egret.

4146 ○. Matamoras, Texas. Dr. Berlandier.

174. GARZETTA CANDIDISSIMA, Bonap. (p. 665.)—Snowy Heron.

4145 ♂. Cadereita, Mex., April, 1853. Lt. Couch, 136.

175. HERODIAS EGRETTA, var. CALIFORNICA, Baird. (p. 667.)

4610. San Diego, Cal. A. Schott.

176. ARDEA HERODIAS, Linn. (p. 668.)—Great Blue Heron or Crane.

9474. Texas. A. Schott.—4144. Tamaulipas. Lt. Couch.—9477. Boca Grande, Mexico, March, 1855. Dr. Kennerly.

Often observed along this river as well as along the Rio Grande. Always solitary.—(Kennerly.)

177. FLORIDA CAERULEA, Baird. (p. 671.)—Blue Heron.

9495. Lower Rio Grande, Tex. A. Schott.

178. BOTAURUS LENTIGINOSUS, Stephens. (p. 674.)—Bittern.

4152. Matamoras, Mexico. Lt. Couch.

179. BUTORIDES VIRESCENS, Bonap. (p. 676.)—Fly-up-the-creek.

9487 ♀. Rio Grande, May 4, 1852. J. H. Clark.—4153 ♀. Rio Nasas, Durango. Lt. Couch.—9488. Eagle Pass, Texas. A. Schott.

180. NYCTIARDEA GARDENI, Baird. (p. 678.)—Night Heron.

4149 ♂. Pesquieria Grande, N. Leon, May, 1853. Lt. Couch.

181. NYCTHERODIUS VIOLACEUS, Reich. (p. 679.)—Yellow-crowned Night Heron.

4147. Matamoras. Lt. Couch.—9481. Rio Grande, Texas, October 13, 1853. A. Schott.

182. TANTALUS LOCULATOR, Linn. (p. 682.)—Wood Ibis.

9496. Major Brown's Island, Rio Grande, October 23, 1853. A. Schott.—9497. Lower Rio Grande. Do.—4144. Matamoras. Lt. Couch.

183. IBIS ALBA, Vieillot. (p. 684.)—White Ibis.

9501. Brownsville, Texas, October 25, 1853.—A. Schott.

184. IBIS ORDII, Bonap. (p. 685.)—Glossy Ibis.

9503. Texas. A. Schott.—4142 ♀. Cadereita, Mex. Lt. Couch.—9506 ♀. Frontera, Rio Grande, Texas. C. Wright.—9504. Santa Cruza, Sonora, June, 1855. Dr. Kennerly, 71.

Quite common in this vicinity, going in large flocks and feeding only in the valley of the river in swampy places. They were found to be very tame and easily killed. Not observed elsewhere on the route.—(Kennerly.)

185. PLATALEA AJAJA, Linn. (p. 686.)—Rosy Spoon-bill.

9499. Lower Rio Grande, Texas. 1853. A. Schott.—9498. Rio Grande, Texas, do.

186. CHARADRIUS VIRGINICUS, Borck. (p. 690.)—Bull-head Plover.

4180. Tamaulipas, Mex. Lt. Couch.

71. Found feeding in the edges of the tank at Escondido.—(D N. Couch.)

187. AEGIALITIS VOCIFERUS, Cassin. (p. 692.)—Kill-deer.

4181 ♂. Near Matamoras, Mex. Lt. Couch.—6594. A. Schott.—6583. Boca Grande, Mex. March, 1855. Dr. Kennerly, 36.

Found near streams and tanks to the Sierra Madre.—(D. N. Couch.)

Observed frequently at Boca Grande and elsewhere along the Corralitos river; generally three or more together. Often heard during the night flying over the camp uttering their peculiar and melancholy note.—(Kennerly.)

188. STREPSILAS INTERPRES, Ill. (p. 701.)—Turnstone.

4188. Brazos Santiago. 4187. Brownsville, Texas. Capt. Van Vliet.

189. RECURVIROSTRA AMERICANA, Gm. (p. 703.)—Avoset.

4174. Brazos. Capt. Van Vliet.

190. HIMANTOPUS NIGRICOLLIS, Vieill. (p. 704.)—Stilt.

4179. Brazos. Capt. Van Vliet.

191. GALLINAGO WILSONII, Bon. (p. 710.)—English Snipe.

4183 ♀. Brownsville, Texas. February, 1853. Lt. Couch.

Found by itself at the tank of Charco Escondido.—(D. N. Couch.)

192. MACRORHAMPHUS GRISEUS, Leach. (p. 712.)—Red-breasted Snipe.

6647 ♀. Espia, Mexico. March 27, 1853. Dr. Kennerly.

This bird was very rare; only observed occasionally in the valley of the Corralitos river and once in the valley of the Palatado. The two specimens procured were associated and no others seen in this vicinity.—(Kennerly.)

193. TRINGA CANUTUS, Linn. (p. 715.)—Gray Back.

4170. Brazos. Capt. Van Vliet.

194. TRINGA MACULATA, Vieill. (p. 720.)—Jack Snipe.

4186. Tamaulipas, Mexico. Lt. Couch.

72. Found at the tank of Charco Escondido.—(D. N. Couch.)

195. GAMBETTA MELANOLEUCA, Bon. (p. 731.)—Tell-Tale.

6625. Eagle Pass, Texas. A. Schott—6628. San Elizario, do.

196. GAMBETTA FLAVIPES, Bon. (p. 732.)—Yellow-Legs.

4179. Fort Brown, Texas. Lt. Couch.

197. NUMENIUS LONGIROSTRIS, Wilson, (p. 743.)—Long-billed Curlew.

Found in flocks in the open prairie near a ranch; natives said they came every day at the same place towards evening, for the purpose of feeding.—(D. N. Couch.)

198. RALLUS VIRGINIANUS, Linn. (p. 748.)—Virginia Rail.

6654. Santa Cruz, Sonora. June, 1855. Dr. Kennerly, 72.

Found in the grass and weeds in the immediate vicinity of the Santa Cruz river. They were extremely rare, the specimen procured being the only one seen.—(Kennerly.)

199. PORZANA CAROLINA, Vieill. (p. 749.)—Common Rail.

4555. Colorado river, Cal. A. Schott, 41.

200. FULICA AMERICANA, Gm. (p. 751.)—Coot.

6621. Espia, Mexico. March, 1855. Dr. Kennerly, 46.—4557. San Pasqual, Cal. A. Schott, 4.

Observed everywhere along the line wherever permanent water was found.—(Kennerly.)

201. GALLINULA GALEATA, Bon. (p. 752.)—Florida Gallinule.

9825. San Pedro. Dr. Kennerly.

202. ANSER GAMBELII, Hartlaub. (p. 761.)—White-fronted Goose.

10463. Frontera, Texas. J. H. Clark.—9967. Rio Grande. A. Schott.

203. BERNICLA CANADENSIS, Boie. (p. 764.)—Canada Goose.

9961. Frontera, Texas. J. H. Clark.

204. DENDROCYGNA AUTUMNALIS, Eyton. (p. 770.)—Long-legged Duck.

Plate XXV.

9871 ♂. Isla los Ayuntas, (Rio Grande.) Sept. 8, 1853. A. Schott.—9872. Texas. do.

205. ANAS BOSCHAS, Linn. (p. 774.)—Mallard.

9693. Boca Grande, Mexico. March, 1855. Dr. Kennerly. 30.

Found abundantly along the Corralitos and Janos rivers; generally in flocks, but sometimes alone. Abundant also along the Rio San Pedro of Sonora.—(Kennerly.)

206. DAFILA ACUTA, Jenyns. (p. 776.)—Pintail.

9769 ♂. Texas. A. Schott.

207. NETTION CAROLINENSIS, Baird. (p. 777.)—Green-winged Teal.

9734 ♂. El Paso, Texas. J. H. Clark.—9728. Boca Grande, Mexico. March, 1858. Dr. Kennerly. 31.

Not very often observed; generally in flocks.—(Kennerly.)

208. QUERQUEDULA DISCORS, Steph. (p. 779.)—Blue-winged Teal.

4140 ♂. New Leon, Mexico. May, 1853. Lieut. Couch.—9751 ♀. Sabinitas, Rio Grande. Sept. 25, 1853. A. Schott.

209. In flocks, May '53. D. N. Couch.

210. QUERQUEDULA CYANOPTERA, Baird. (p. 780.)—Red-breasted Teal.

9739 ♂. El Paso, Texas. J. H. Clark.

211. SPATULA CLYPEATA, Boie. (p. 781.)—Shoveller.

4138 ♀. New Leon, Mexico. Lieut. Couch.

212. CHAULELASMUS STREPERUS, Gray. (p. 782.)—Gadwall.

9794 ♂. Janos, Mexico. April, 1855. Dr. Kennerly. 87.

This beautiful duck was very common in the vicinity of Janos in the month of April, going in large flocks. Beyond this point it was not observed.—(Kennerly.)

213. MARECA AMERICANA, Steph. (p. 783.)—Baldpate.

9713 ♂. El Paso, Texas. J. H. Clark.—9706. Boca Grande, Mexico. March, 1855. Dr. Kennerly. 28.

Found on Janos and Corralitos rivers at various points. At this season generally going in pairs, rarely in large flocks. Very shy.—(Kennerly.)

214. FULIX COLLARIS, Baird, (p. 792.)—Ring-necked Duck.

9870. Boca Grande, Mexico. March, 1855. Dr. Kennerly. 32.—Janos, Chihuahua. April, 1855. Do.

The first specimen was procured at Boca Grande, the only one there observed. It was quite tame and easily approached. The second specimen was procured on Janos river in April where it was found in very large flocks.—(Kennerly.)

215. AYTHYA AMERICANA, Bon. (p. 793.)—Red-head.

4621. Rio Grande. Feb. 7, 1855. A. Schott. 45.

216. BUCEPHALA ALBEOLA, Baird, (p. 797.)—Butter Ball.

4886. Colorado Laguna, N. M. A. Schott. 59.—9844 ♂. Boca Grande, Mexico. March, 1855. Dr. Kennerly. 29.

Found at this season in flocks at Boca Grande and other points on the Corralitos and Janos rivers.—(Kennerly.)

217. ERISMATURA RUBIDA, Bonap (p. 811.)—Ruddy Duck.

9848. Janos, Mexico. April, 1855. Dr. Kennerly. 65.—9847, 4607. San Pasqual, Cal. A. Schott.

Found in large flocks on a small lake near Janos, in April, and observed in pairs on the Palatado in the same month.—(Kennerly.)

218. MERGUS AMERICANUS, Cassin. (p. 813.)—Goosander.

9881. Boca Grande, Chihuahua. March, 1855. Dr. Kennerly. 33.

Frequently observed here and elsewhere along the Corralitos river in large flocks. Exceedingly fat and heavy, but not at all palatable, owing to the fact that they feed entirely upon fishes. The specimen when procured had within its throat several fishes, three or four inches in length.—(Kennerly.)

219. LARUS DELAWARENSIS, Ord. (p. 846.)—Ring-billed Gull.

4161. Brazos, Texas. Captain Van Vliet.

220. CHROICOCEPHALUS ATRICILLA, Linn. (p. 850.)—Laughing Gull.

Brazos, Texas. Captain Van Vliet.

221. STERNA ACUFLAVIDA, Cabot. (p. 860.)—Cabot's Tern.

Brazos, Texas. Captain Van Vliet.

222. RHYNCHOPS NIGRA, Linn. (p. 866.)—Skimmer.

Brazos, Texas. Captain Van Vliet.

223. PELECANUS ERYTHRORHYNCHUS, Gmelin. (p. 868.)—White Pelican.

9947. Rio Grande, Texas, 1853. A. Schott.

224. GRACULUS MEXICANUS, Bon. (p. 879.—Texas Cormorant.

3834. Brazos, Texas. Captain Van Vliet.

225. PODICEPS CLARKII, Lawrence. (p. 891.)—Clark's Grebe.

9930. Chihuahua Territory. J. H. Clark.

226. PODICEPS DOMINICUS, Lath. Mexican Grebe.

The existence of this bird in Texas, is shown by its eggs collected at Matamoras, by Dr. Berlandier.

ALPHABETICAL INDEX.

Page.
Accipiter cooperi 3
fuscus 3
Aegialitis vociferus 25
Agelaius gubernator 18
phoeniceus 18
tricolor 18
American raven 20
Ampelis cedrorum 11
Anas boschas 26
Anser gambelii 26
Antrostomus nuttalli 6
Anthus ludovicianus 10
Archibuteo ferrugineus 4
Ardea herodias 24
Ash-throated fly-catcher 8
Asturina nitida 4
Athene cunicularia 5
hypugaea 5
Audubon's oriole 19
warbler 10
Avoset 25
Aythya americana 27

Baldpate 27
Baltimore oriole 19
Band-tailed pigeon 21
Barn owl 4
swallow 11
Bathmidurus major 7
Bell's vireo 12
Belted king fisher 7
Bernicla canadensis 26
Bewick's wren 13
Bittern 24
Black-cheeked tit 14
chinned humming bird 6
sparrow 16
crested tit 14
fly-catcher 8
headed fly-catcher 12
throated green warbler 10
sparrow 15
Blanding's finch 18
Blue-gray fly-catcher 13
Blue grosbeak 16
heron 24
winged teal 26
Boat-tailed grakle 20
Botaurus lentiginosus 24
Brewer's blackbird 20
sparrow 16

Page.
Broad-tailed humming bird 6
Bubo virginianus 4
Bucephala albeola 27
Bull-head plover 25
Bullock's oriole 20
Burrowing owl 5
Buteo borealis 3
calurus 3
elegans 3
montanus 3
swainsonii 3
Butorides virescens 24
Butterball 27

Cabot's tern 28
Calamospiza bicolor 16
California jay 20
quail 22
woodpecker 6
Callipepla squamata 23
Campylorhynchus brunneicapillus 13
Canada goose 26
Cardinalis virginianus 17
Carpodacus frontalis 14
Cassin's fly-catcher 8
Cathartes aura 3
Catherpes mexicanus 13
Cedar bird 11
Centurus flaviventris 5
uropygialis 6
Ceryle alcyon 7
americana 7
Chamaepelia passerina 22
Chaparral cock 5
Charadrius virginicus 25
Chaulelasmus streperus 27
Chiacalaca 22
Chondestes grammaca 15
Chordeiles popetue 7
texensis 7
Chroicocephalus atricilla 28
Chrysomitris mexicana 14
Circus hudsonius 4
Clark's grebe 28
Clay-colored bunting 16
Colaptes chrysoides 6
mexicanus 6
Collyrio excubitoroides 11
Columba flavirostris 21
fasciata 21
Common dove 21

Page.
Common gallinule 26
  rail 26
Contopus richardsonii 9
Cooper's hawk 3
Coot 26
Corvus carnivorus 20
  cryptoleucus 20
Coturniculus passerinus 15
Cotyle serripennis 11
Couch's fly-catcher 8
Cow bird 18
Craxirex unicinctus 4
Curlew 25
Cyanocitta californica 20
  sordida 21
  ultramarina 21
  woodhousii 20
Cyanospiza ciris 17
  parellina 17
  versicolor 17
Cyrtonyx massena 23

Dafila acuta 26
Demiegretta rufa 24
Dendrocygna autumnalis 26
Dendroica aestiva 10
  audubonii 10
  superciliosa 10
  virens 10
Dwarf thrush 9

Embernagra rufivirgata 16
Empidonax obscurus 9
  pusillus 9
English snipe 25
Eremophila cornuta 14
Erismatura rubida 27

Falco aurantius 3
  columbarius 3
  femoralis 3
  sparverius 3
Fish hawk 4
Florida caerulea 24
Fly-up-the-creek 24
Fulica americana 26
Fulix collaris 27

Gadwall 27
Gallinago wilsonii 25
Gallinula galeata 26
Gambel's partridge 23
Gambetta melanoleuca 25
Garzetta candidissima 24
Geococcyx californianus 5
Geothlypis macgillivrayi 10
  trichas 10
Gila woodpecker 6
Glossy ibis 24
Goosander 27
Graculus mexicanus 28

Page.
Grass finch 15
Gray back 25
Great blue heron or crane 24
  horned owl 4
Green black-cap fly-catcher 10
  winged teal 26
Ground dove 22
Grus canadensis 24
Guiraca caerulea 16

Harporhynchus curvirostris 12
  lecontii 12
  longirostris 13
Herodias egretta var. californica 24
Himantopus nigricollis 25
Hirundo bicolor 11
  horreorum 11
  thalassina 11
Harris' buzzard 4
  woodpecker 5
Helminthophaga celata 10
Hooded oriole 19
House finch 14
Hutton's fly-catcher 12

Ibis alba 24
  ordii 24
Icteria longicauda 10
Icterus audubonii 19
  baltimore 19
  bullockii 20
  cucullatus 19
  parisorum 19
  spurius 19
  waglerii 19

Jacksnipe 25

Killdeer plover 25

Lark bunting 16
  finch 15
Larus delawarensis 27
Laughing gull 28
Lawrence's fly-catcher 8
Leconte's mocking bird 12
Lincoln's finch 16
Long-billed water thrush 10
Long-legged duck 25
Long tailed chat 10
Lophophanes atricristatus 14
  wollweberi 14
Lophortyx californicus 22
  gambelii 23

Macgillivray's warbler 10
Macrorhamphus griseus 25
Mallard 26
Mareca americana 27
Marsh hawk --
Maryland yellow-throat 10

Page.

- Massena partridge, 23
- Melanerpes formicivorus, 6
- Melopelia leucoptera, 21
- Melospiza lincolnii, 16
  - melodia, 16
- Mergus americanus, 27
- Mexican grebe, 28
  - goldfinch, 14
  - trogon, 5
- Milvulus forficatus, 7
- Mimus polyglottus, 12
- Mocking bird, 12
- Molothrus pecoris, 18
- Momotus caeruliceps, 7
- Mountain mocking bird, 12
- Myiarchus lawrencii, 8
  - mexicanus, 8
- Myiodioctes pusillus, 10

- Nettion carolinensis, 26
- Night hawk, 7
  - heron, 24
- Numenius longirostris, 25
- Nyotherodius violaceus, 24
- Nyctiardea gardeni, 24
- Nuttall's whip-poor-will, 6

- Orange-crowned warbler, 10
- Orchard oriole, 19
- Oreoscoptes montanus, 12
- Ortalida McCalli, 22
- Ortyx texanus, 22
  - virginianus, 22

- Painted bunting, 17
- Pandion carolinensis, 4
- Parkmann's wren, 13
- Paroides flaviceps, 14
- Partridge, 22
- Passerculus alaudinus, 15
- Pelecanus erythrorhynchus, 28
- Pachyrhamphus aglaiae, 7
- Peucaea cassinii, 16
- Pewee, 8
- Phainopepla nitens, 11
- Picus harrisii, 5
  - scalaris, 5
- Pigeon hawk, 3
- Pintail, 26
- Pipilo abertii, 18
  - chlorura, 18
  - megalonyx, 17
  - mesoleucus, 18
- Platalea ajaja, 25
- Podiceps clarkii, 28
  - dominicus, 28
- Polyborus tharus, 4
- Pooecetes gramineus, 15
- Poospiza bilineata, 15
- Porzana carolina, 26
- Polioptila caerulea, 13

Page.

- Polioptila plumbea, 14
- Prairie owl, 5
- Progne purpurea, 11
- Psaltriparus melanotis, 14
- Psilorhinus morio, 21
- Purple martin, 11
- Pyranga aestiva, 11
- Pyrocephalus rubineus, 9
- Pyrrhuloxia sinuata, 17

- Querquadula cyanoptera, 26
  - discors, 26
- Quiscalus macroura, 20
  - major, 20

- Rallus virginianus, 26
- Recurvirostra americana, 25
- Red and white-shouldered blackbird, 18
- Red-backed humming bird, 6
- Red-billed dove, 21
- Red bird, 17
- Red-breasted snipe, 25
  - teal, 26
- Red-eyed fly-catcher, 12
- Red fly-catcher, 9
- Red-headed duck, 27
- Red-shafted flicker, 6
- Red-shouldered blackbird, 18
- Red-tailed hawk, 3
- Reddish egret, 24
- Regulus calendula, 9
- Rhynchops nigra, 28
- Rhynchopsitta pachyrhyncha, 5
- Ring-billed gull, 27
  - necked duck, 27
- Rio Grande jay, 21
- Rock wren, 13
- Rocky mountain blue bird, 9
- Rose-throated fly-catcher, 7
- Rosy spoon-bill, 25
- Rough-winged swallow, 11
- Ruby-crowned wren, 9
  - throated humming bird, 6
- Ruddy duck, 27

- Salpinctes obsoletus, 13
- Sand-hill crane, 24
- Saw-bill, 7
- Sayornis fuscus, 8
  - nigricans, 8
  - sayus, 9
- Say's fly-catcher, 9
- Scaled or blue partridge, 23
- Scaly dove, 22
- Scardafilla squamosa, 22
- Scissor-tail, 7
- Scolecophagus cyanocephalus, 20
- Scops McCalli, 4
- Seiurus ludovicianus, 10
- Selasphorus platycercus, 6
  - rufus, 6

Page.

Setophaga picta 11
Sharp-shinned hawk 3
Short-legged pewee 9
Shoveller 27
Sialia arctica 9
  mexicana 9
  skimmer 28
Snowy heron 24
Song sparrow 16
Sparrow hawk 3
Spatula clypeata 27
Spermophila morelettii 17
Spizella atrigularis 16
  breweri 16
  pallida 16
Squirrel hawk 4
Sterna acuflavida 28
Stilt 25
Strepsilas interpres 25
Strix pratincola 4
Sturnella neglecta 19
Summer red bird 11
Swamp blackbird 1

Tantalus loculator 24
Texas cormorant 28
  kingfisher 7
  night hawk 7
  quail 22
  screech owl 4
Thick-billed parrot ....
Thryothorus berlandieri 13
  bewickii 13
Tit lark 10
Tringa canutus 25
  maculata 25
Trochilus alexandri 6
  colubris 6
Troglodytes parkmanni 13
Trogon mexicanus 5
Turdus nanus 9
Tyrannus couchii 8
  vociferans ....
Turkey buzzard 3

Page.

Turnstone 25

Ultramarine jay 21

Violet-green swallow 11
Vireo atricapillus 12
  belli 12
  flavoviridis 12
  huttoni 12
  noveboracensis 12
  olivaceus 12
Virginia rail 26

Western bluebird 9
  lark 19
  red-tail 3
White-bellied swallow 11
  crowned sparrow 15
  eyed vireo 12
  fronted goose 26
  ibis 24
  necked crow 20
  pelican 28
  rumped shrike 11
  throated wren 13
  winged dove 21
Wood ibis 24
Woodhouse's jay 20

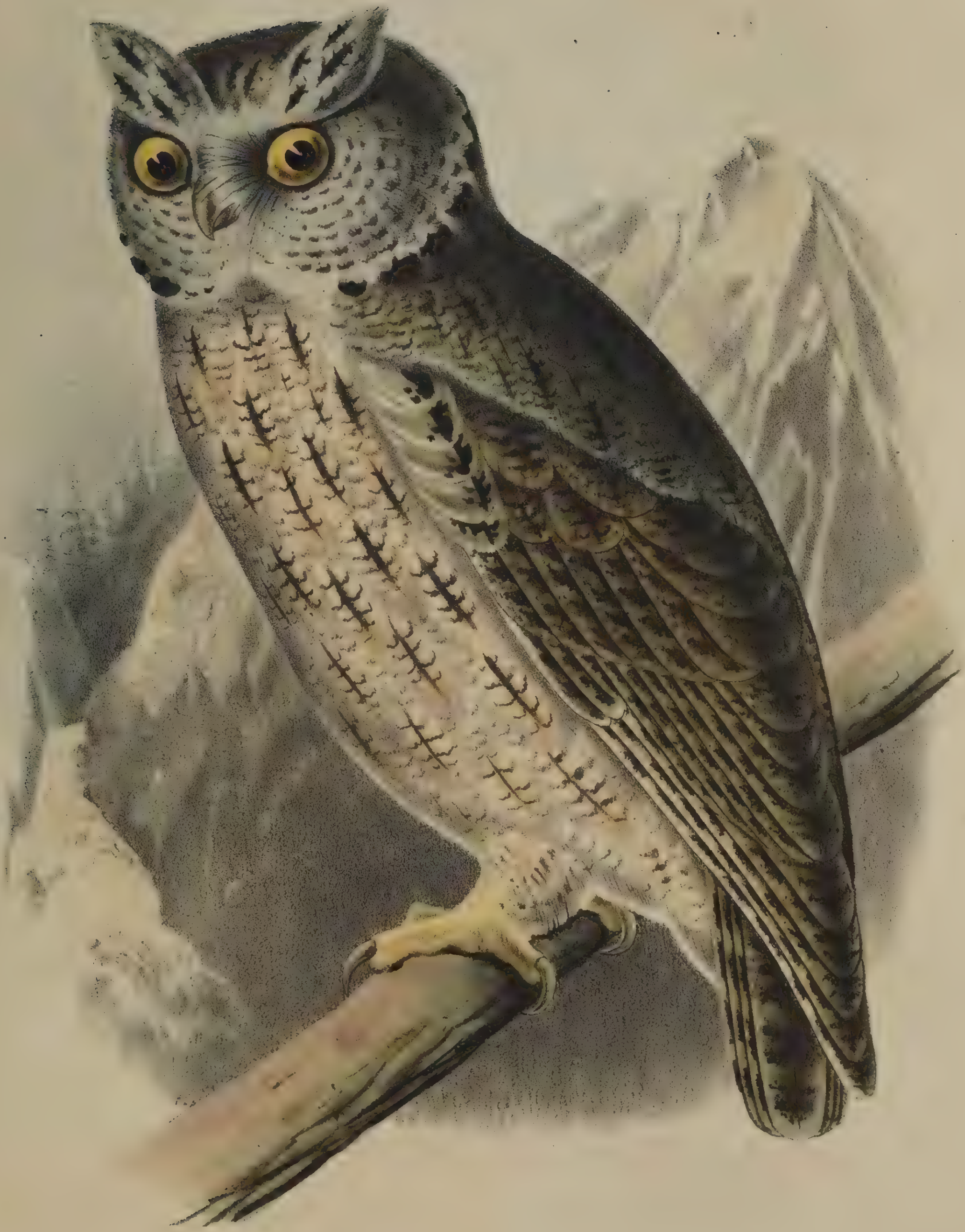
Xanthocephalus icterocephalus 18
Xanthoura luxuosa 21

Yellow-bellied woodpecker 5
  crowned night heron 24
  headed blackbird 18
  legs 25
  poll 10
  throated warbler 10
  winged sparrow 15

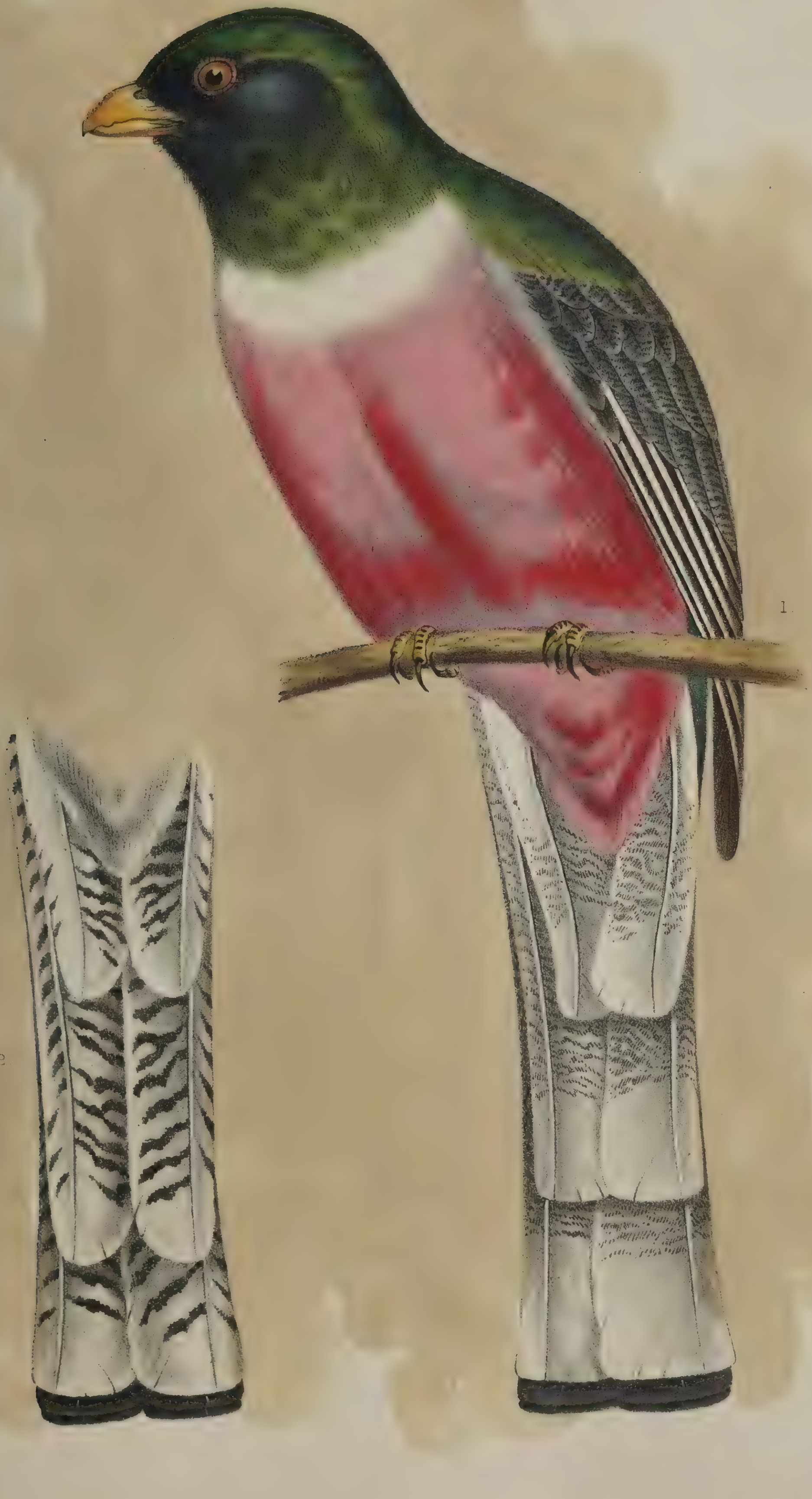
Zenaidura carolinensis 21
Zonotrichia gambelii 15
  leucophrys 15

LIST OF PLATES.

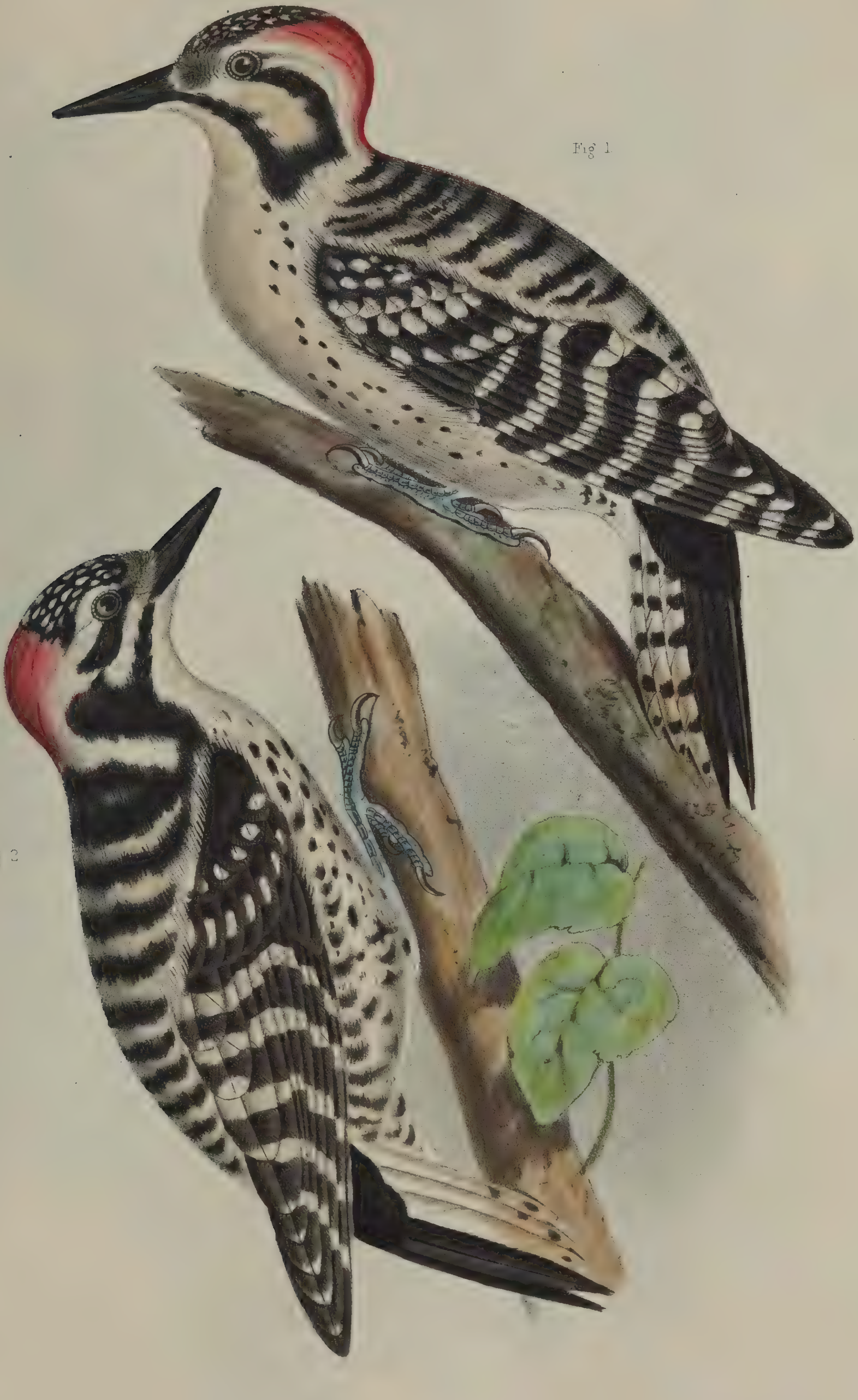
Plate I.——Scops mc calli.
Plate II.——Fig. 1.—Trogon mexicanus. Male.
Fig. 2.—Trogon mexicanus. Under view of tail showing the difference of mottling.
Plate III.——Picus scalaris.—Fig. 1, male; Fig. 2, female.
Plate IV.——Centurus flaviventris.—Fig. 1, male; Fig. 2, female.
Plate V.——Fig. 1—2.—Selasphorus platycercus.—Fig. 1, male; Fig. 2, female.
Fig. 3.—Trochilus alexandri. Male.
Plate VI.——Chordeiles texensis. Male.
Plate VII.——Ceryle americana.—Fig. 1, adult; Fig. 2, young.
Plate VIII.——Momotus caeruliceps.
Plate IX.——Fig. 1.—Pachyrhamphus aglaiae. Male.
Fig. 2.—Bathmidurus major. Female.
Fig. 3.—Myiarchus lawrencii. Female.
Plate X.——Tyrannus vociferans.
Plate XI.——Fig. 1.—Tyrannus couchii.
Fig. 2.—Tyrannus melancholicus. Tail.
Fig. 3.—Empidonax obscurus.
Plate XII.——Harporhynchus lecontii.
Plate XIII.——Harporhynchus curvirostris.
Plate XIV.——Harporhynchus longirostris.
Plate XV.——Fig. 1.—Lophophanes wollweberi.
Fig. 2.—Paroides flaviceps.
Fig. 3.—Psaltriparus melanotis.
Plate XVI.——Fig. 1.—Chrysomitris mexicanus.
Fig. 2.—Spermophila moreletii. Male.
Fig. 3.—Spermophila moreletii. Female.
Plate XVII.—Fig. 1.—Spizella atrigularis.
Fig. 2.—Embernagra rufivirgata.
Plate XVIII.--Fig. 1.—Cyanoloxia parellina. Male.
Fig. 2.—Cyanospiza versicolor. Male.
Plate XIX.——Fig. 1.—Icterus parisorum.
Fig. 2.—Icterus wagleri.
Plate XX.——Quiscalus macroura. Details of head, wing, tail and feet.
Plate XXI.——Cyanocitta woodhousii.
Plate XXII.—Fig. 1.—Cyanocitta sordida.
Fig. 2.—Cyanocitta ultramarina. *a*, side view of bill; *b*, tail from above.
Plate XXIII.--Columba flavirostris.
Plate XXIV.--Ortyx texanus.
Plate XXV.—Dendrocygna autumnalis.



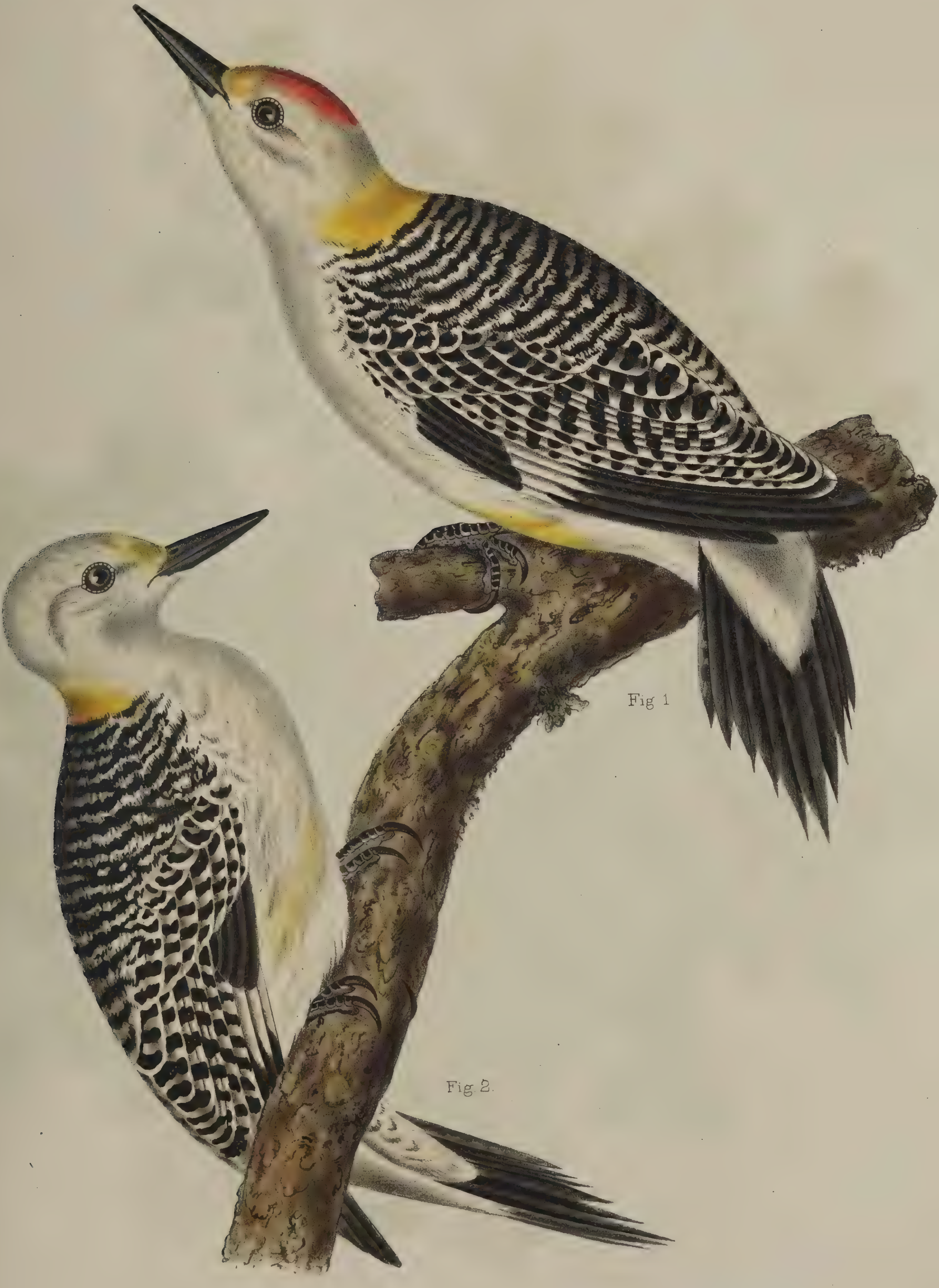
SCOPS Mc CALLII.



1. TROGON MEXICANUS. (Male)_2. Under View of a Tail of different Specimen.



1. PICUS SCALARIS _ 2 PICUS NUTTALLII



CENTURUS FLAVIVENTRIS_1 Male._2 Female

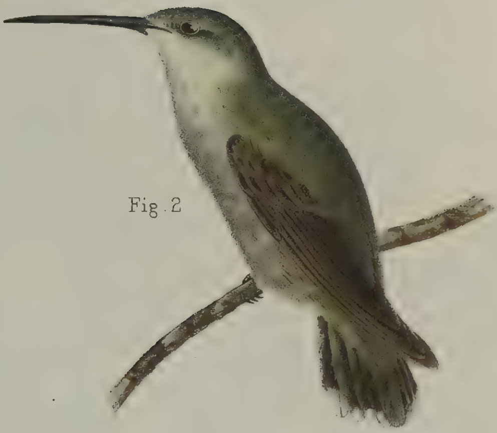


Fig. 2

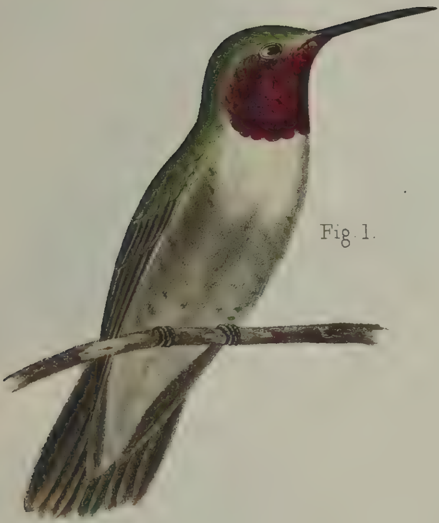


Fig. 1.

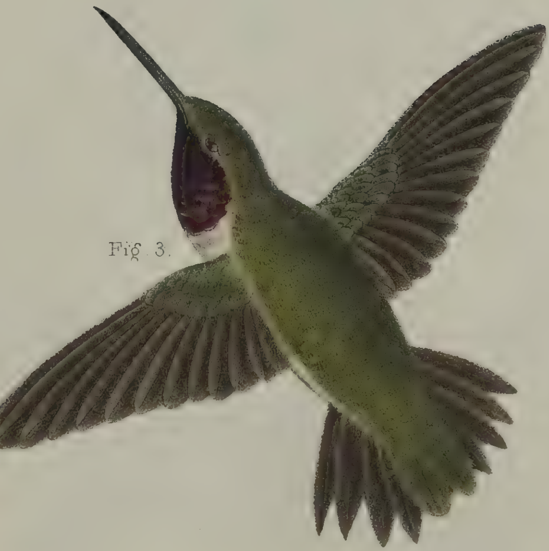
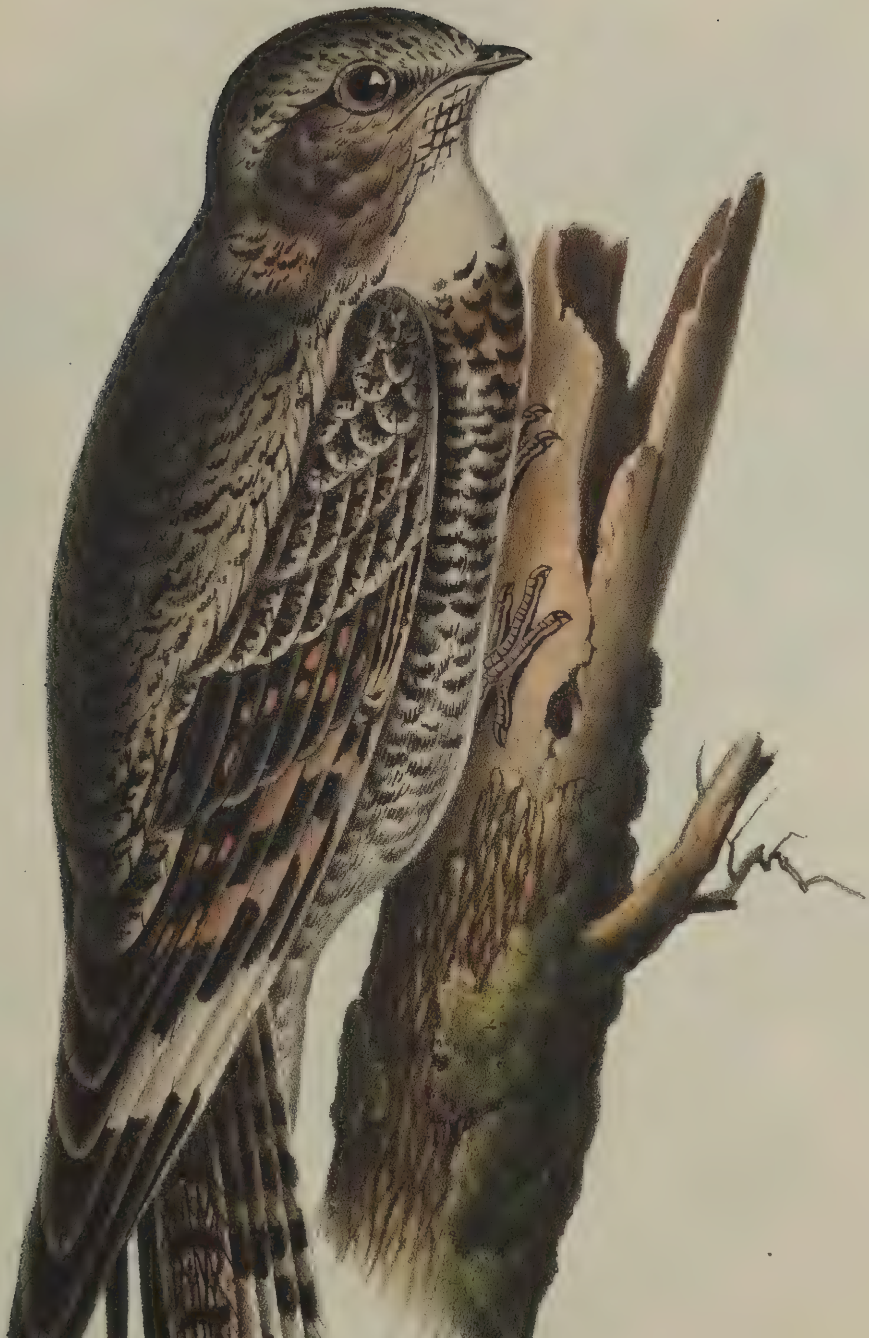
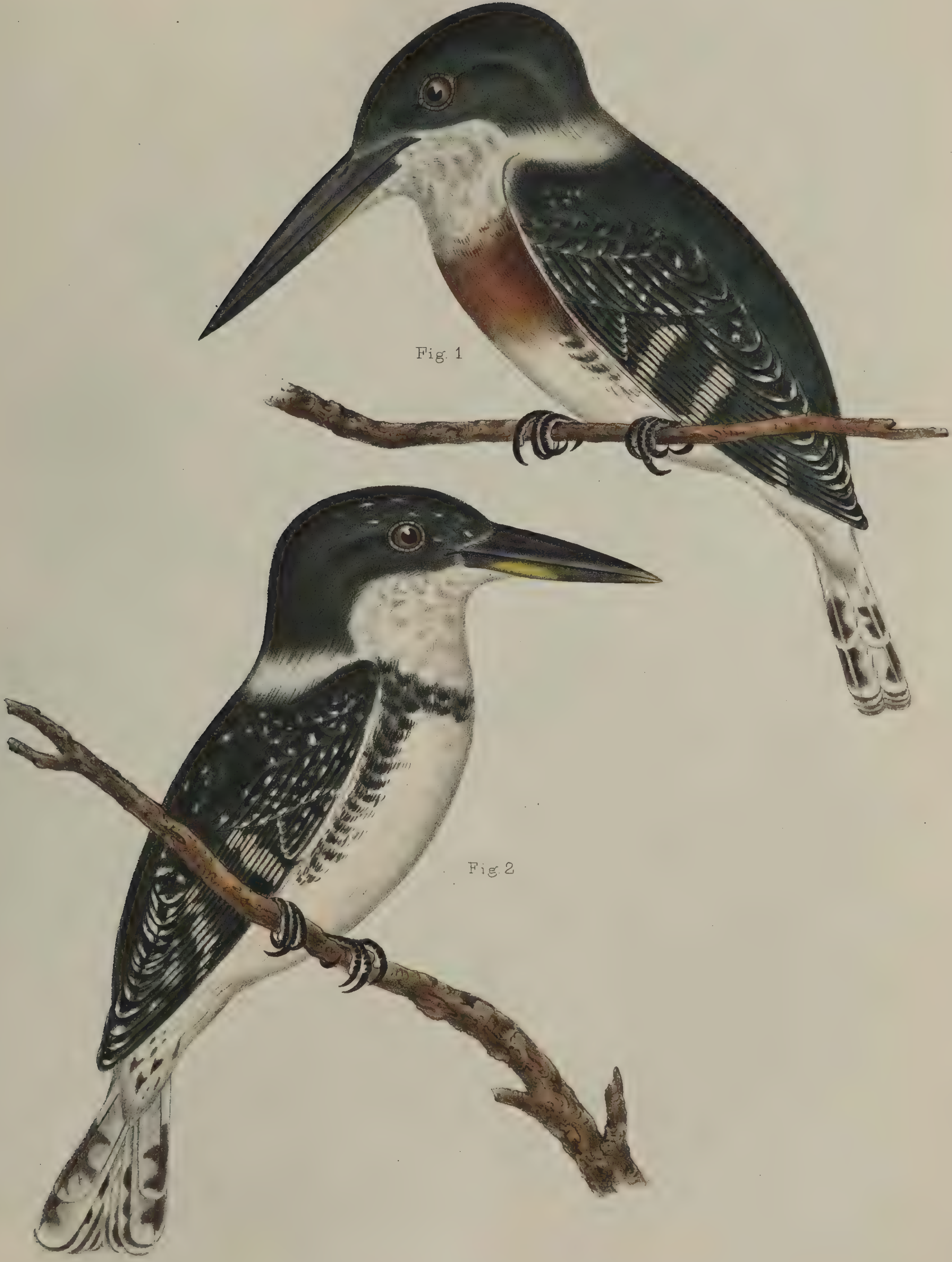


Fig. 3.

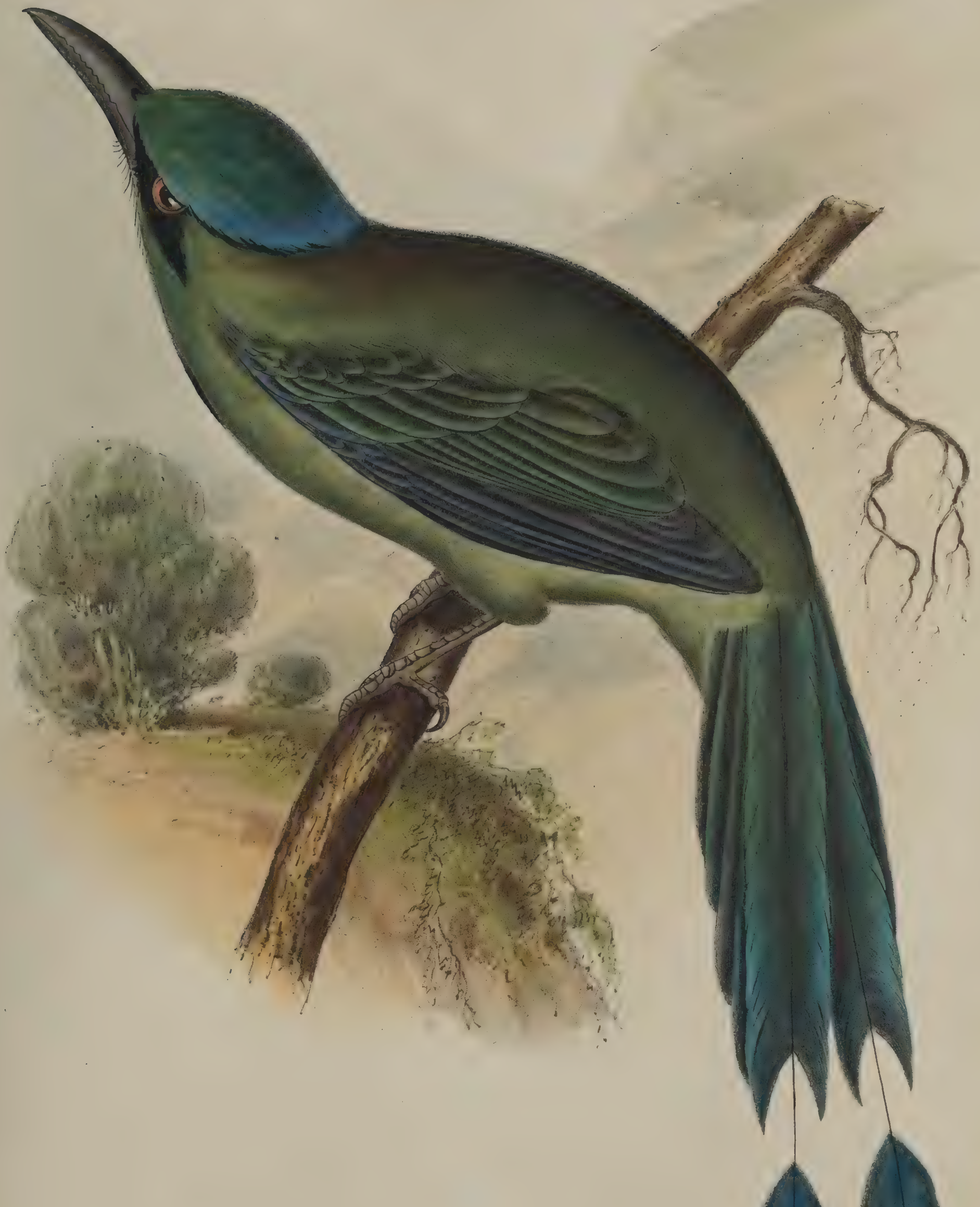
1. 2. SELASPHORUS PLATYCERCUS. – 1. Male. 2. Female.
3. TROCHILUS ALEXANDRI. – Male.



CHORDEILES TEXENSIS.

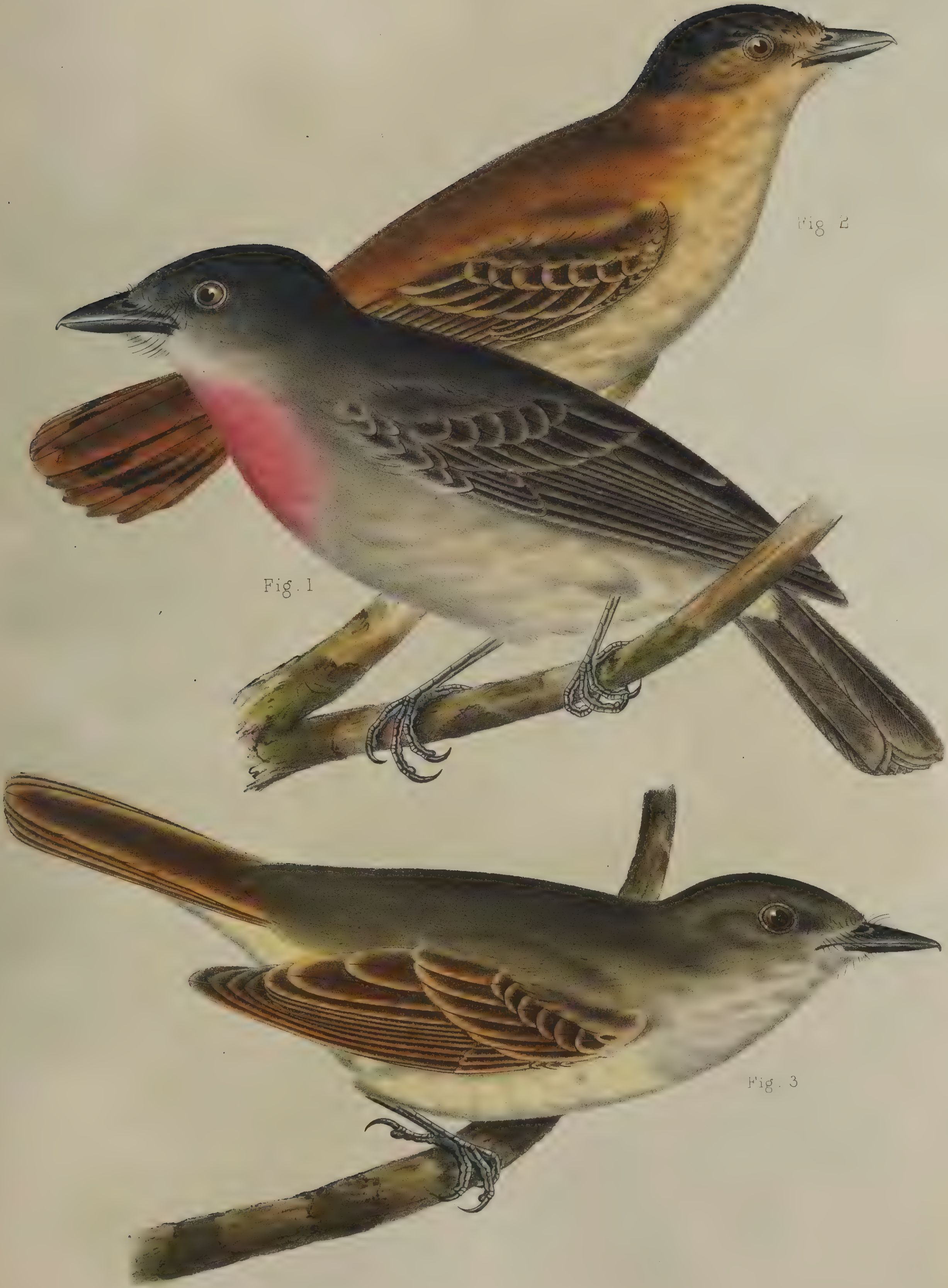


CERYLE AMERICANA.——1. Adult. 2. Young.

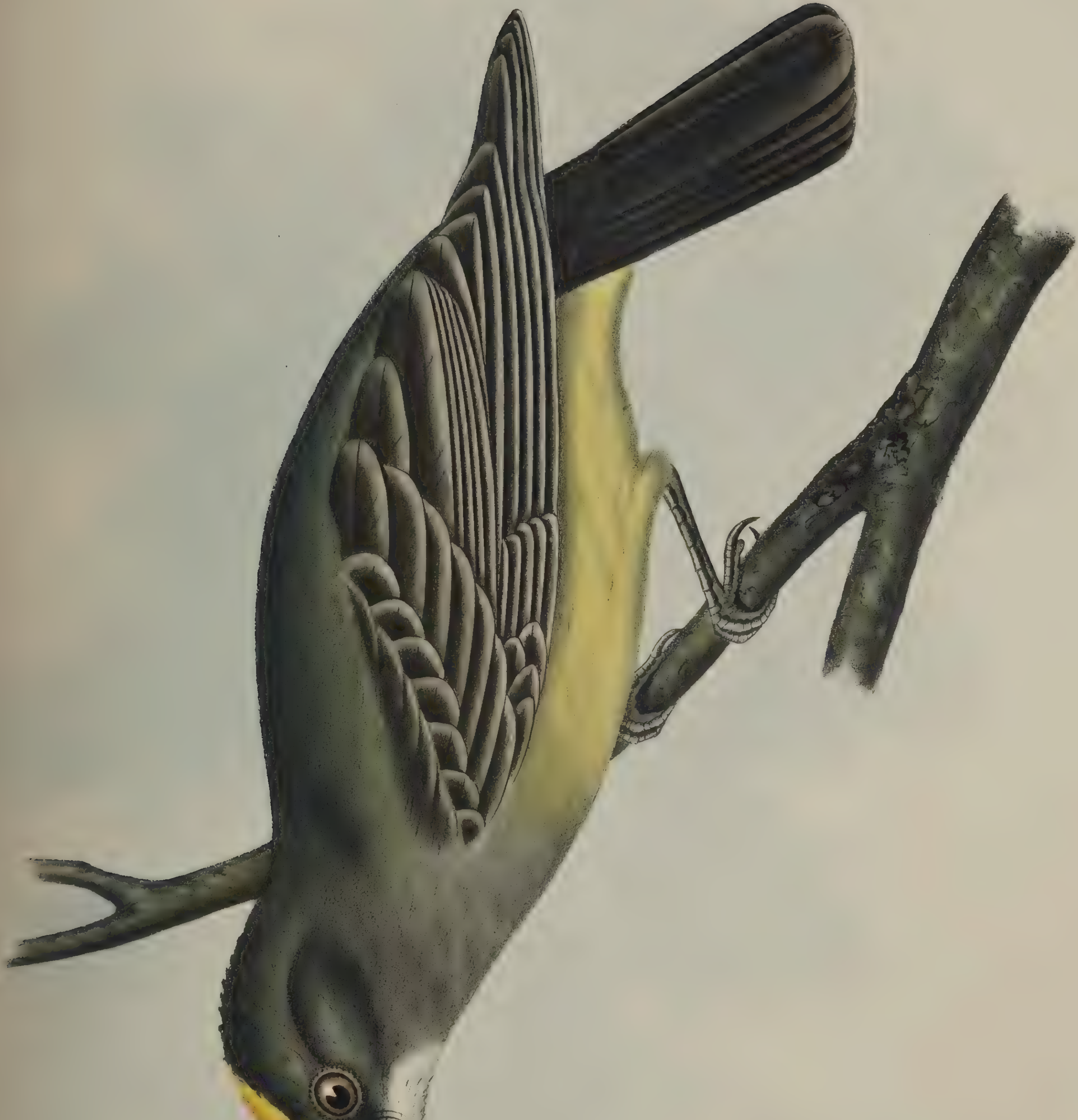


MOMOTUS COERULICEPS

Lith. et col. Bowen & Co. Philada.



1. PACHYRHAMPHUS AGLAIAE. Male.
2. BATHMIDURUS MAJOR. Female.
3. MYARCHUS LAWRENCII. Female.



TYRANNUS VOCIFERANS.

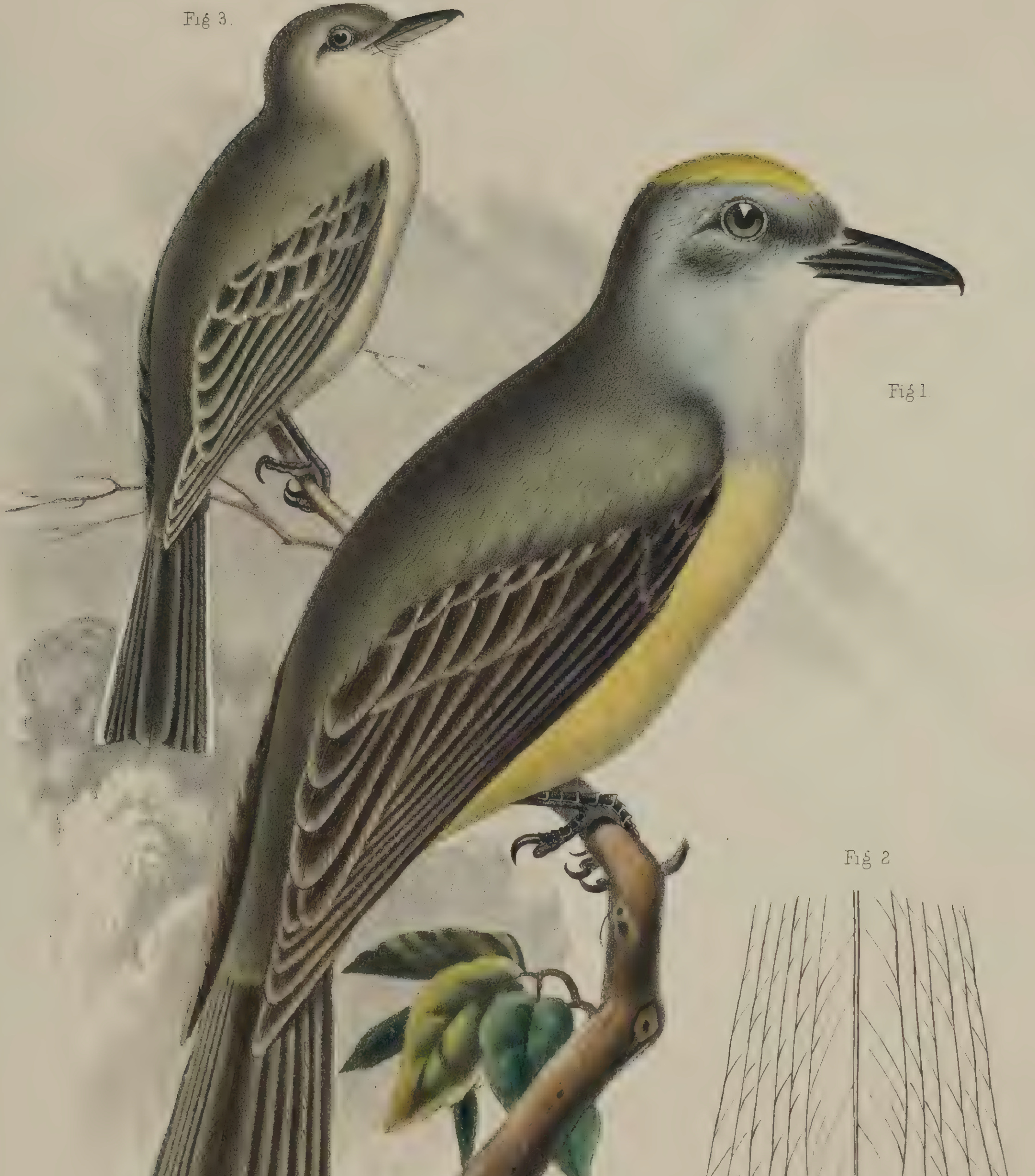
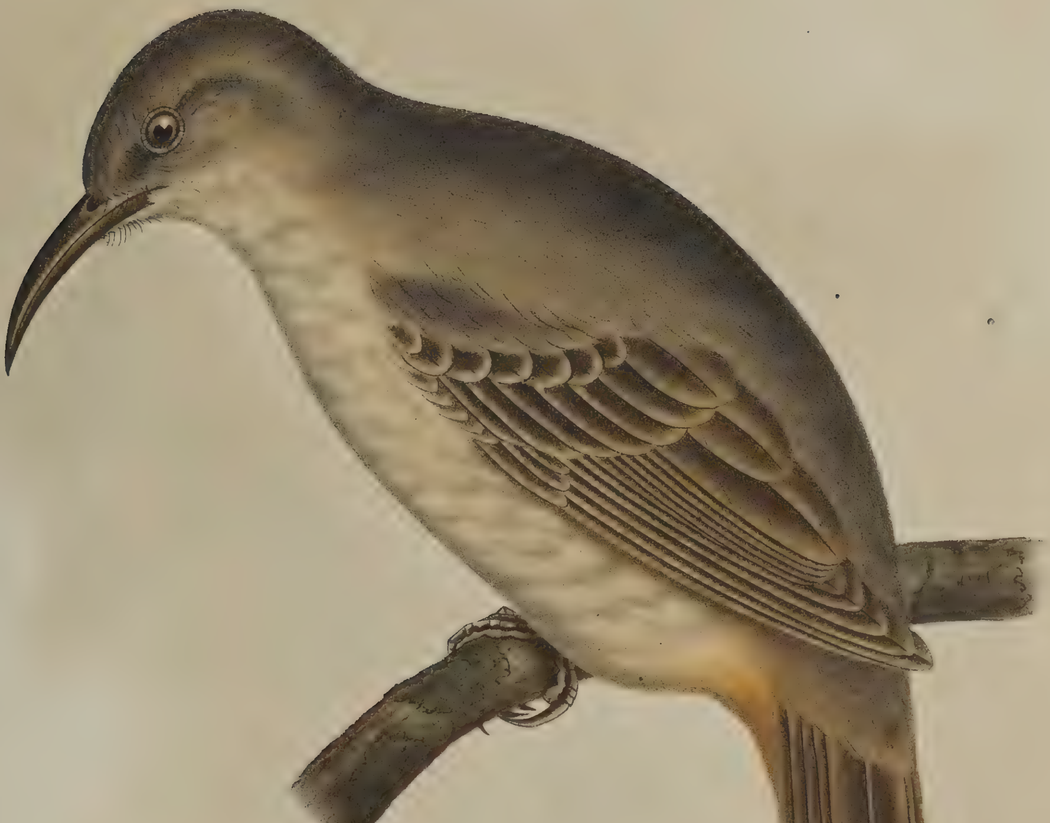


Fig 3.

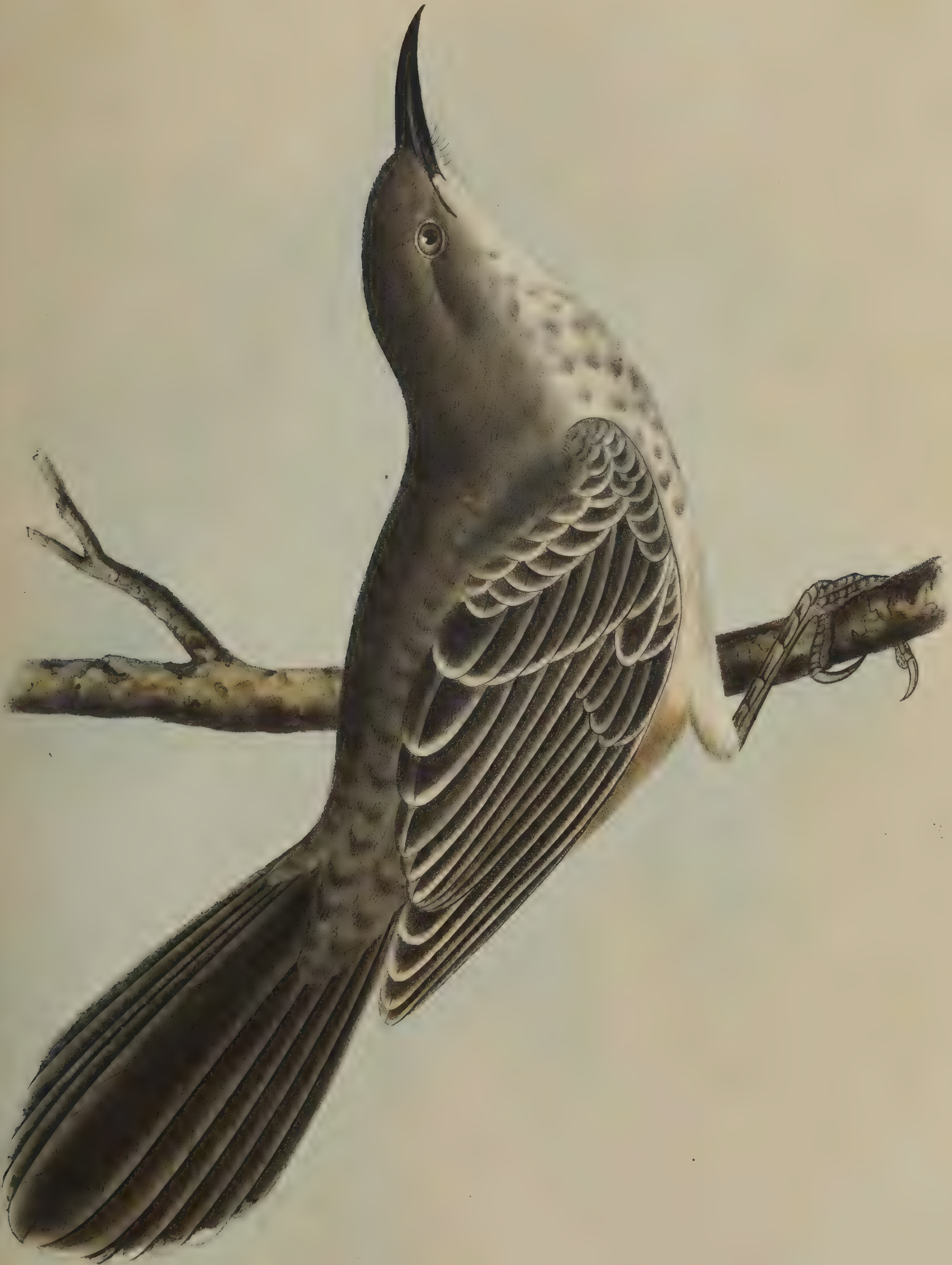
Fig 1.

Fig 2

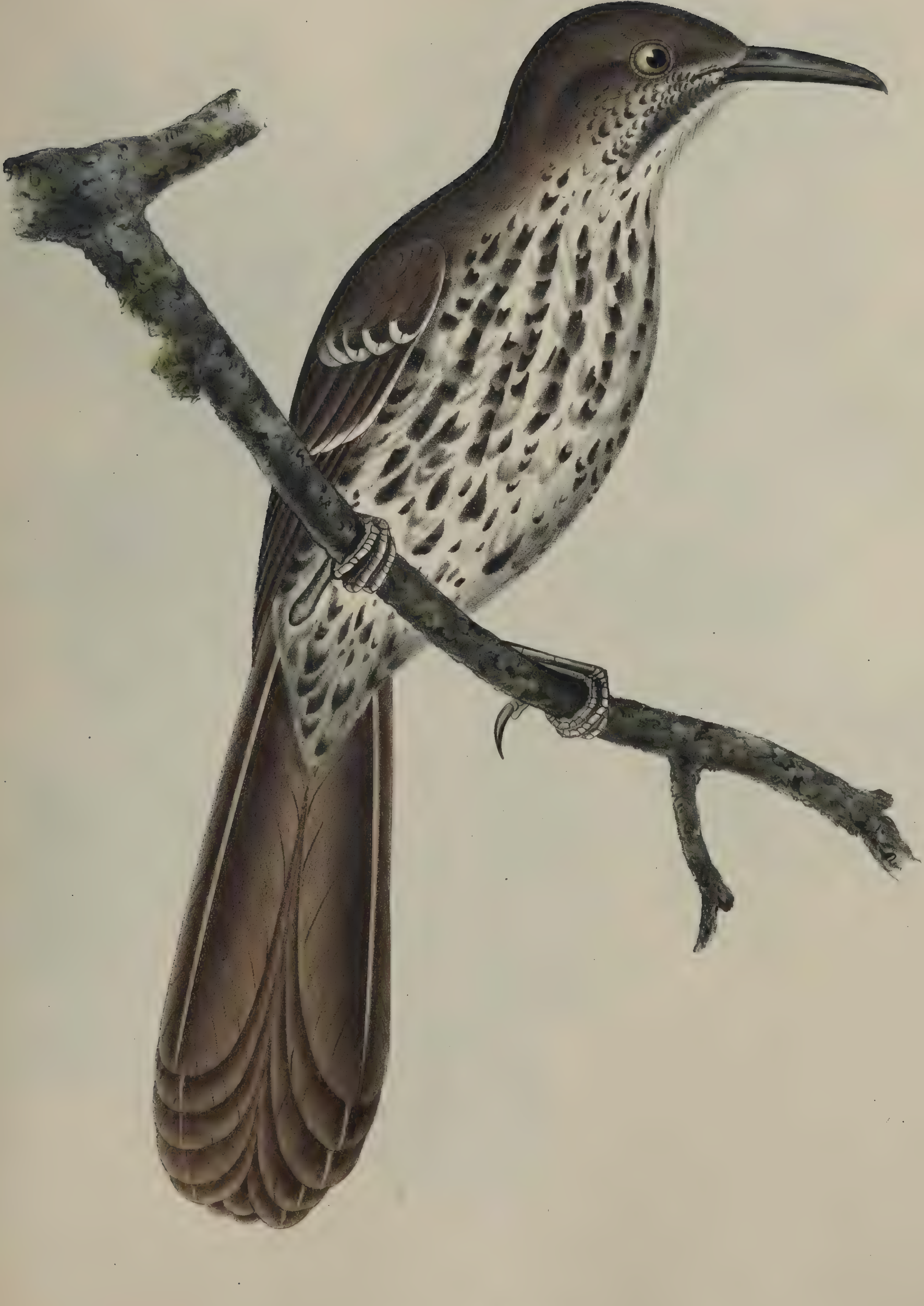
1 TYRANNUS COUCHII – 2. TYRANNUS MELANCHOLICUS, Tail
3. EMPIDONAX OBSCURUS.



TOXOSTOMA LECONTEI.



TOXOSTOMA CURVIROSTRIS



TOXOSTOMA LONGIROSTRIS.

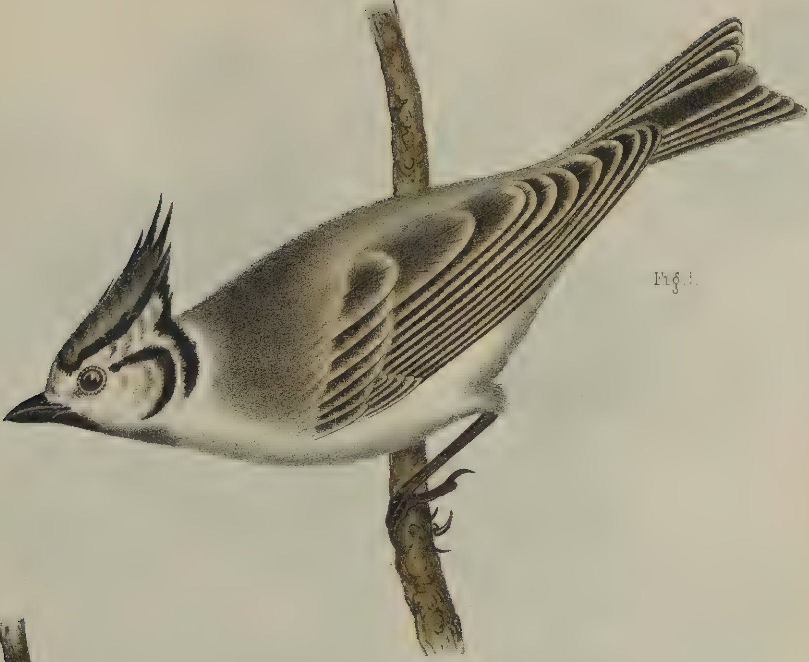


Fig 1.

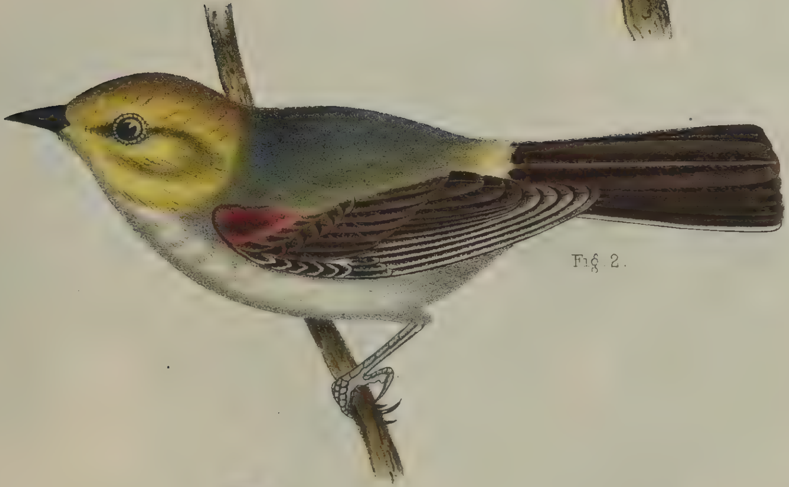


Fig 2.

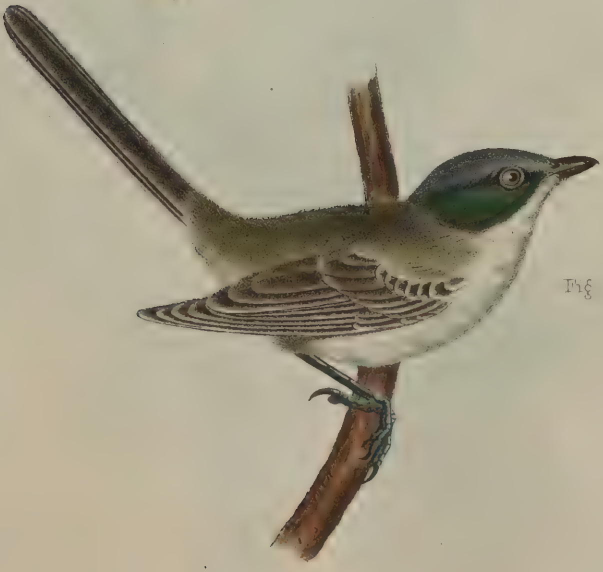


Fig 3.

LOPHOPHANES WOLLWEBERI_ 2. ÆGITHALUS FLAVICEPS_ 3. PSALTRIPARUS MELANOTIS.

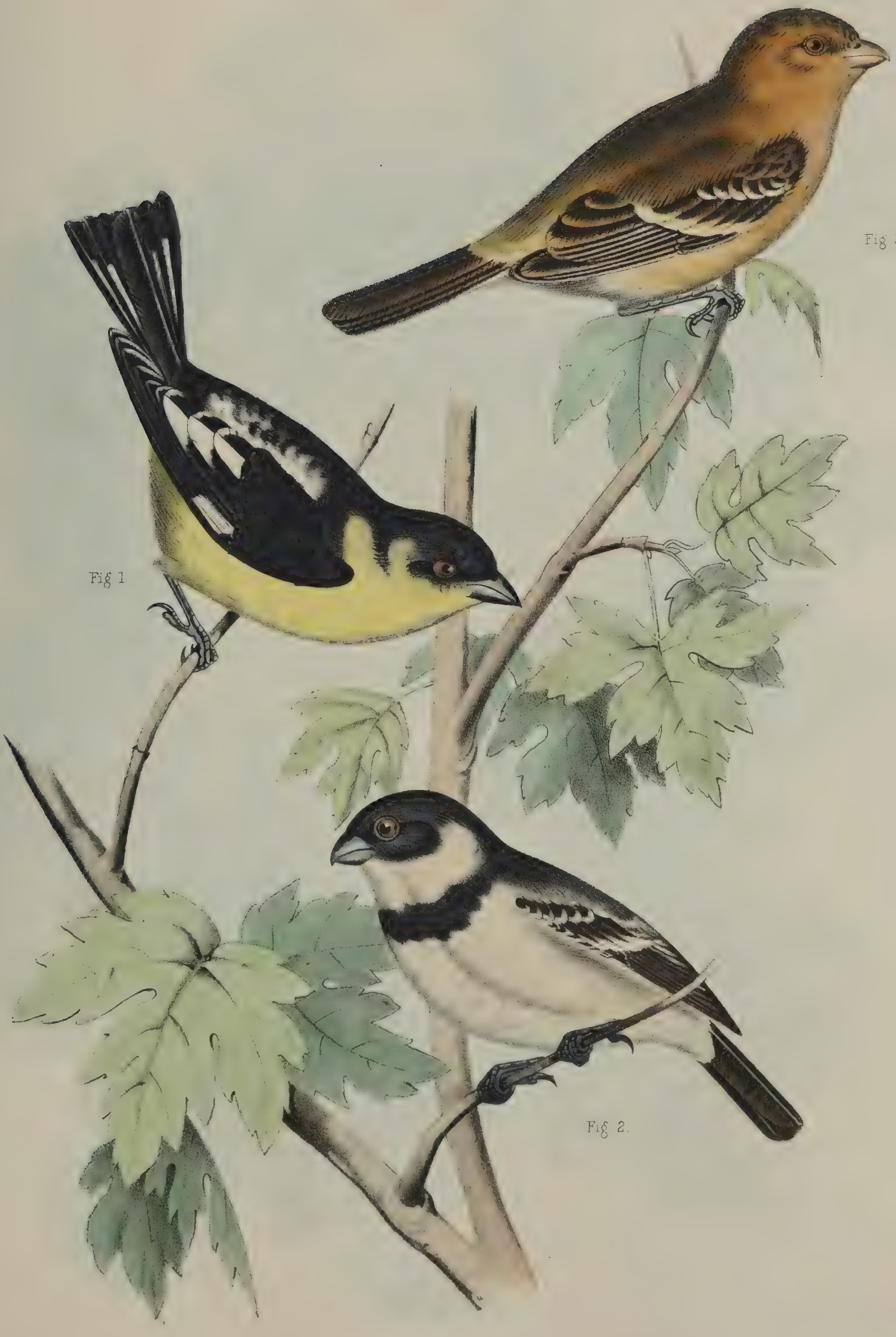
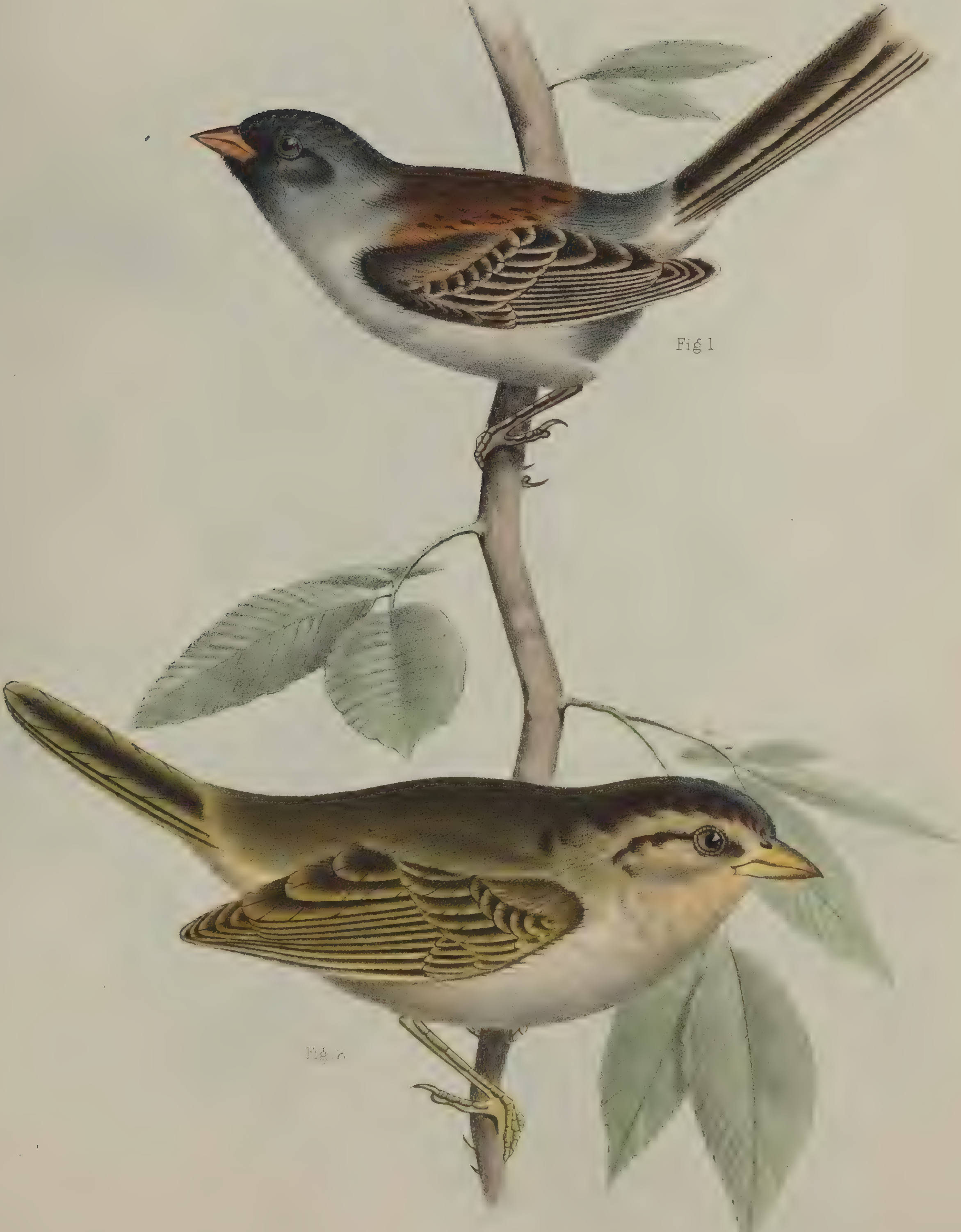
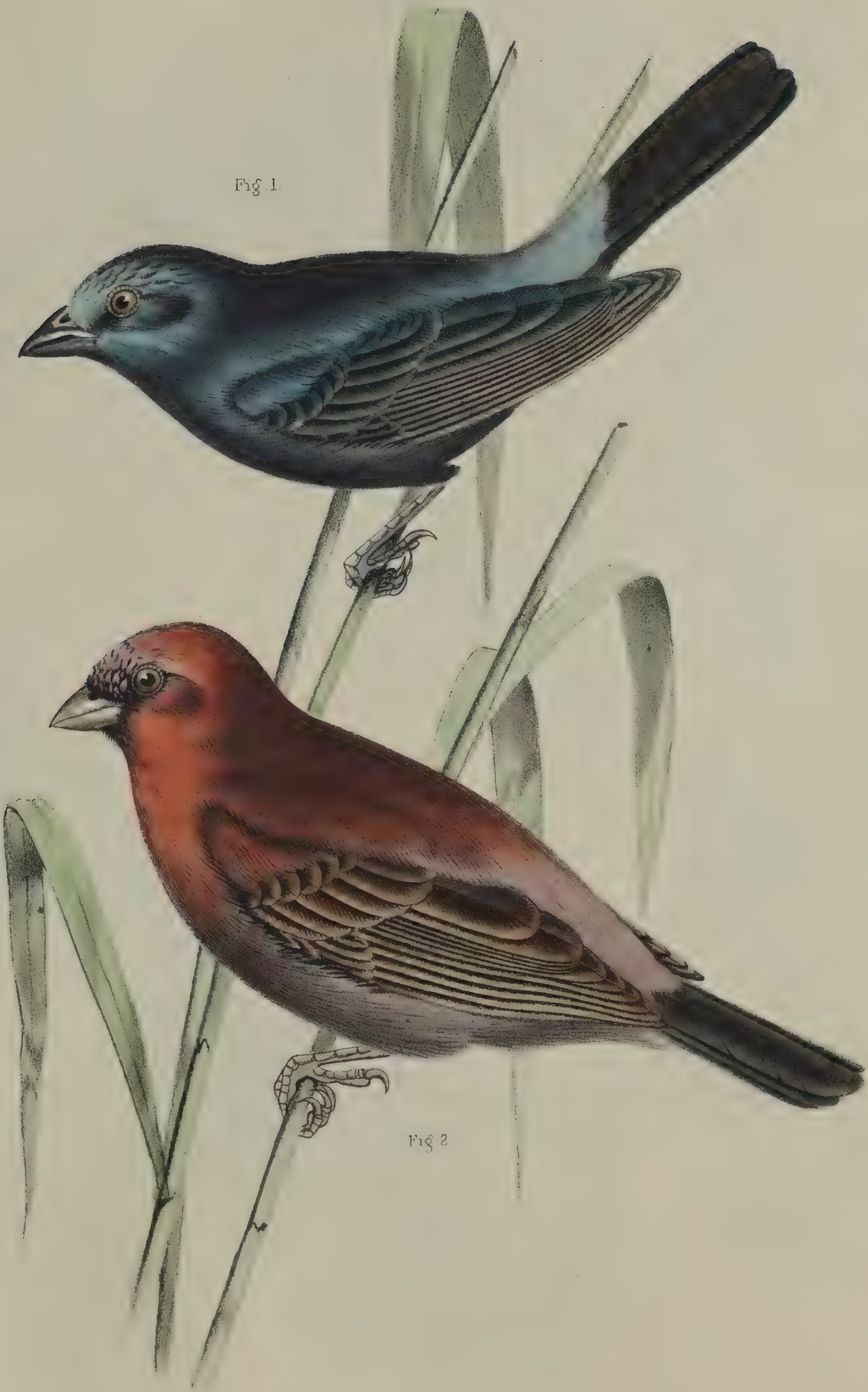


Fig 3.
Fig 1
Fig 2.

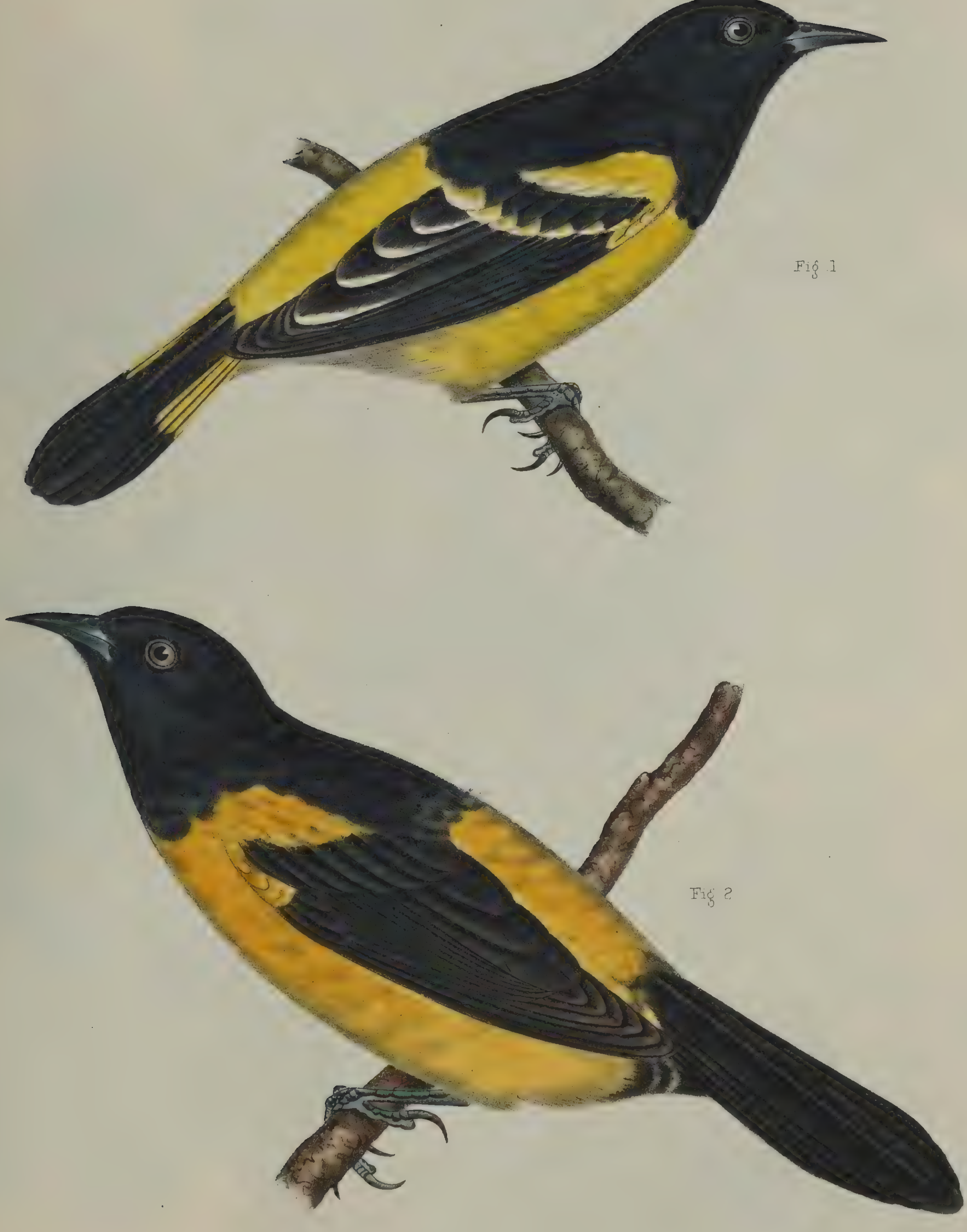
1. CHRYSOMITRIS MEXICANUS _ 2. SPERMOPHILA MORELETII (Male)



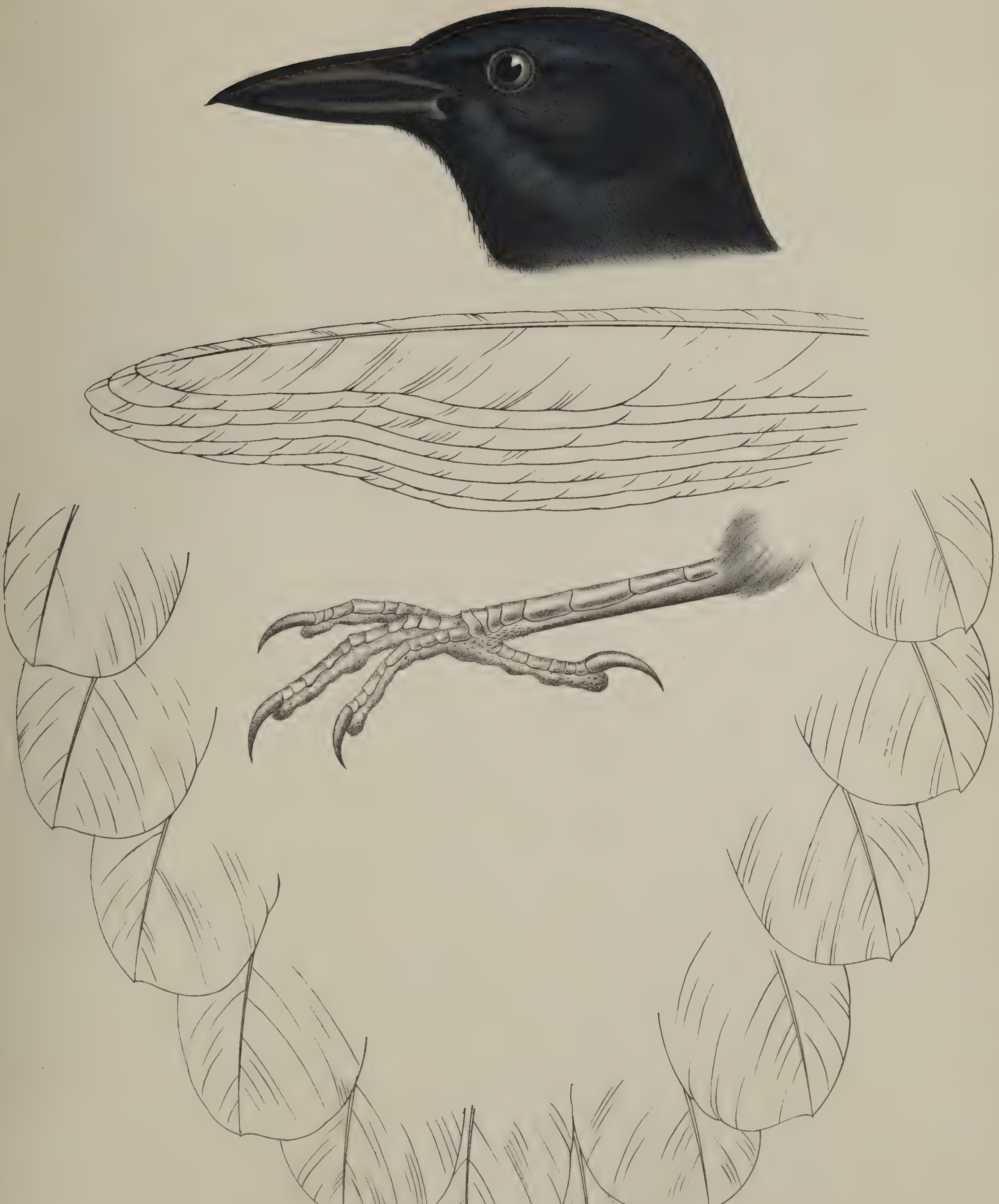
1 SPIZELLA ATRIGULARIS.
2 EMBERNAGRA RUFIVIRGATA.



1. CYANOLOXIA PARELLINA, Male — 2. SPIZA VERSICOLOR, Male.

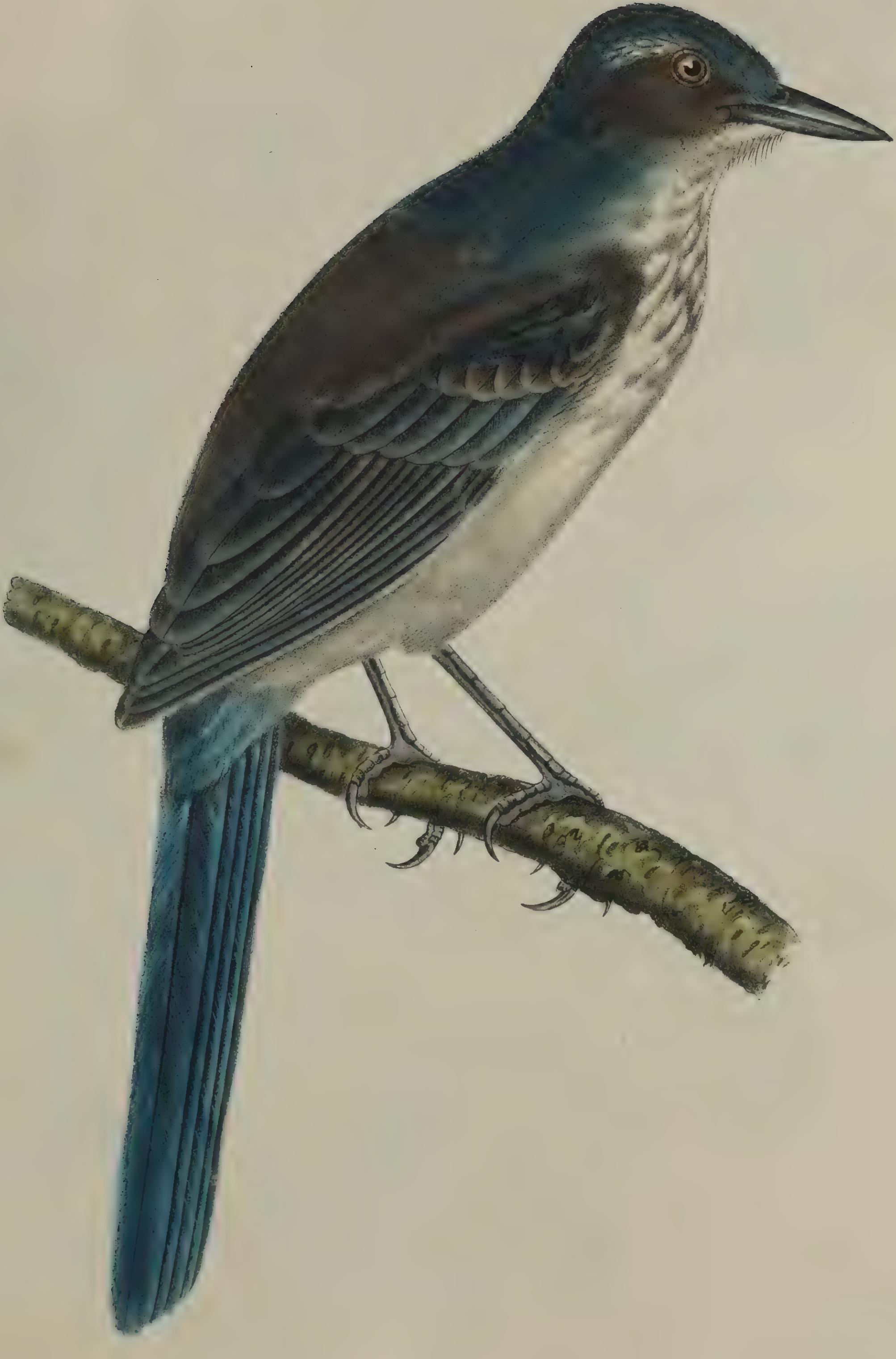


1. ICTERUS PARISORUM _ 2. ICTERUS WAGLERI

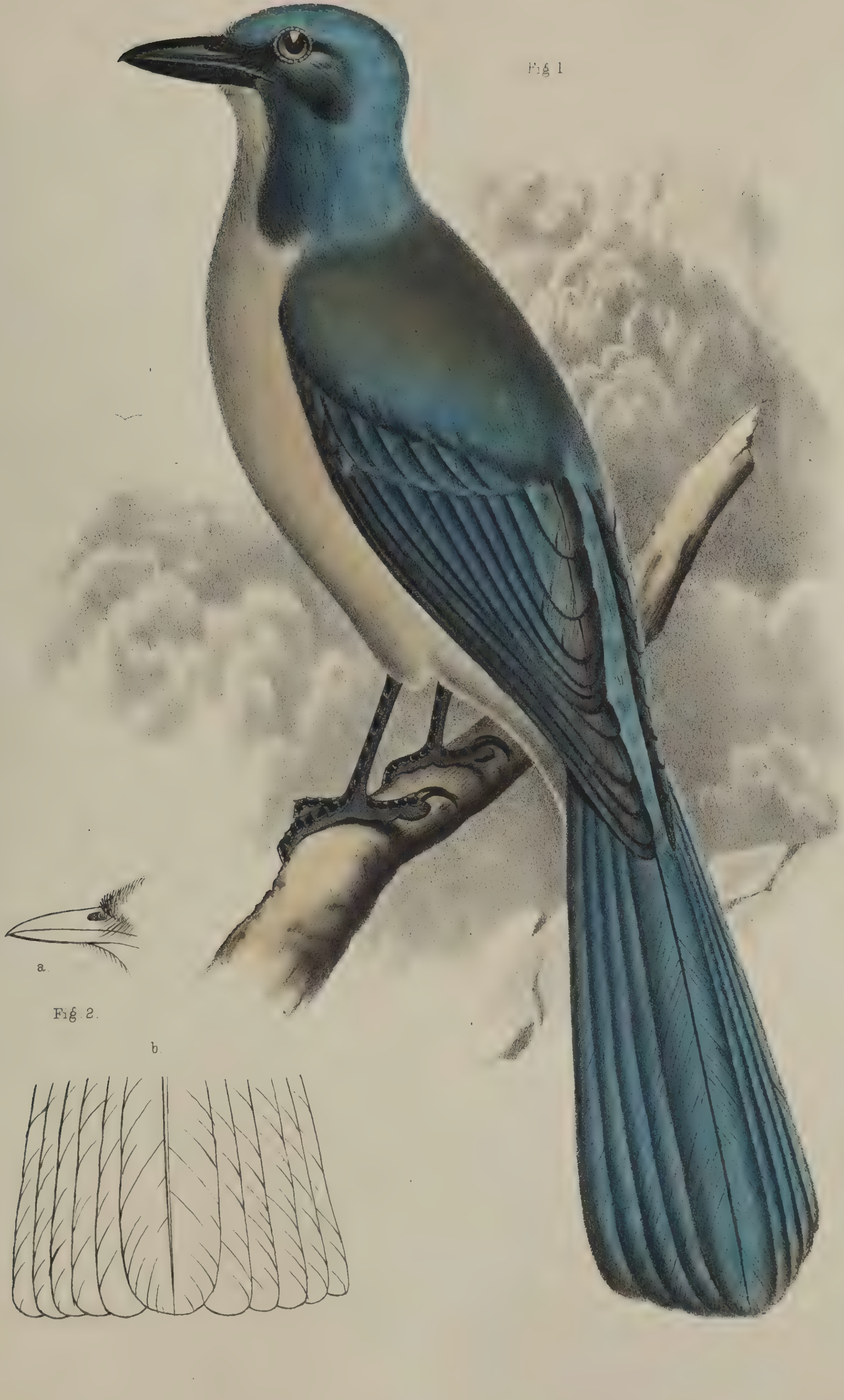


QUISCALUS MACROURUS

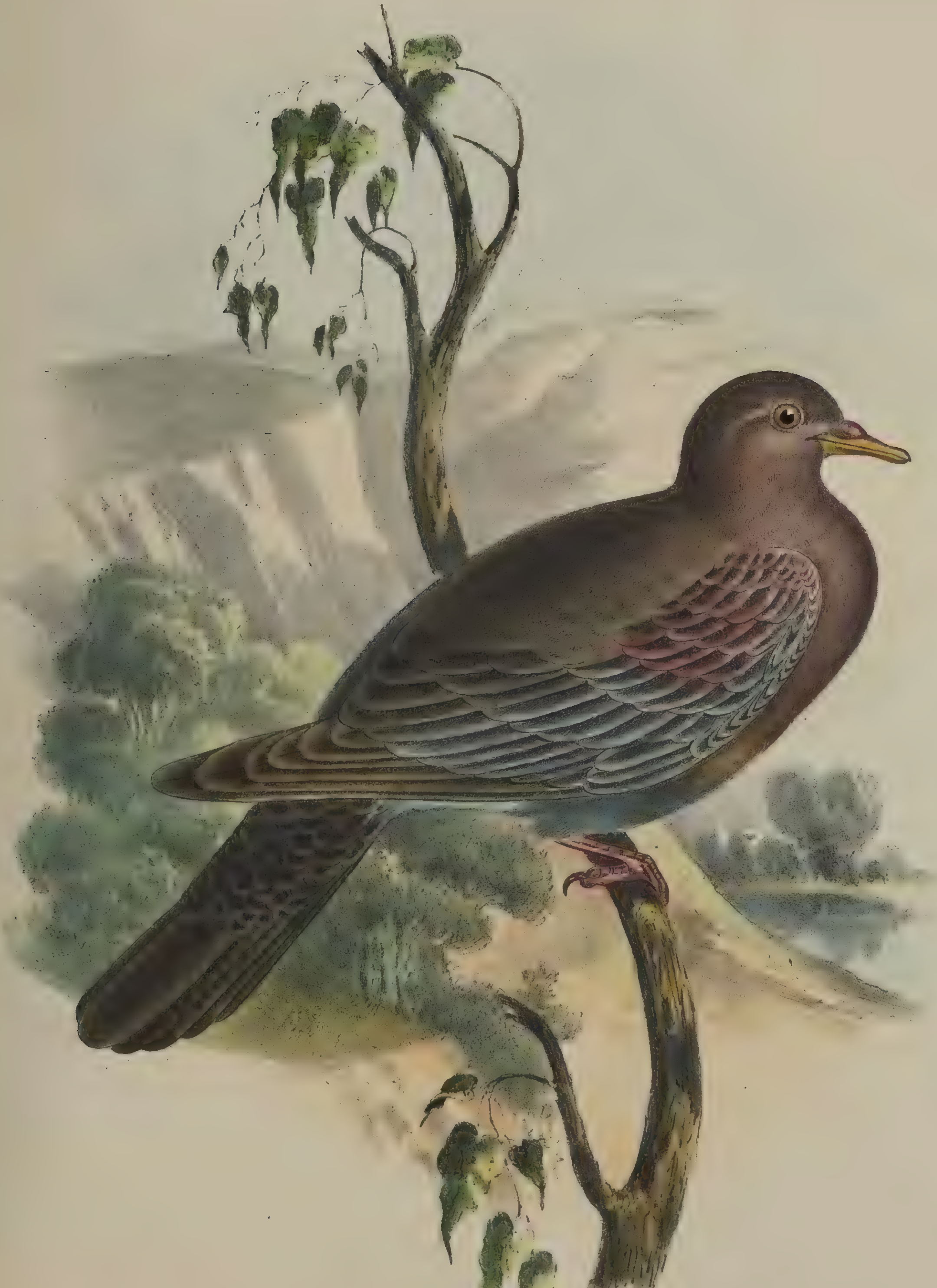
Pl. 21



CYANOCITTA WOODHOUSEI

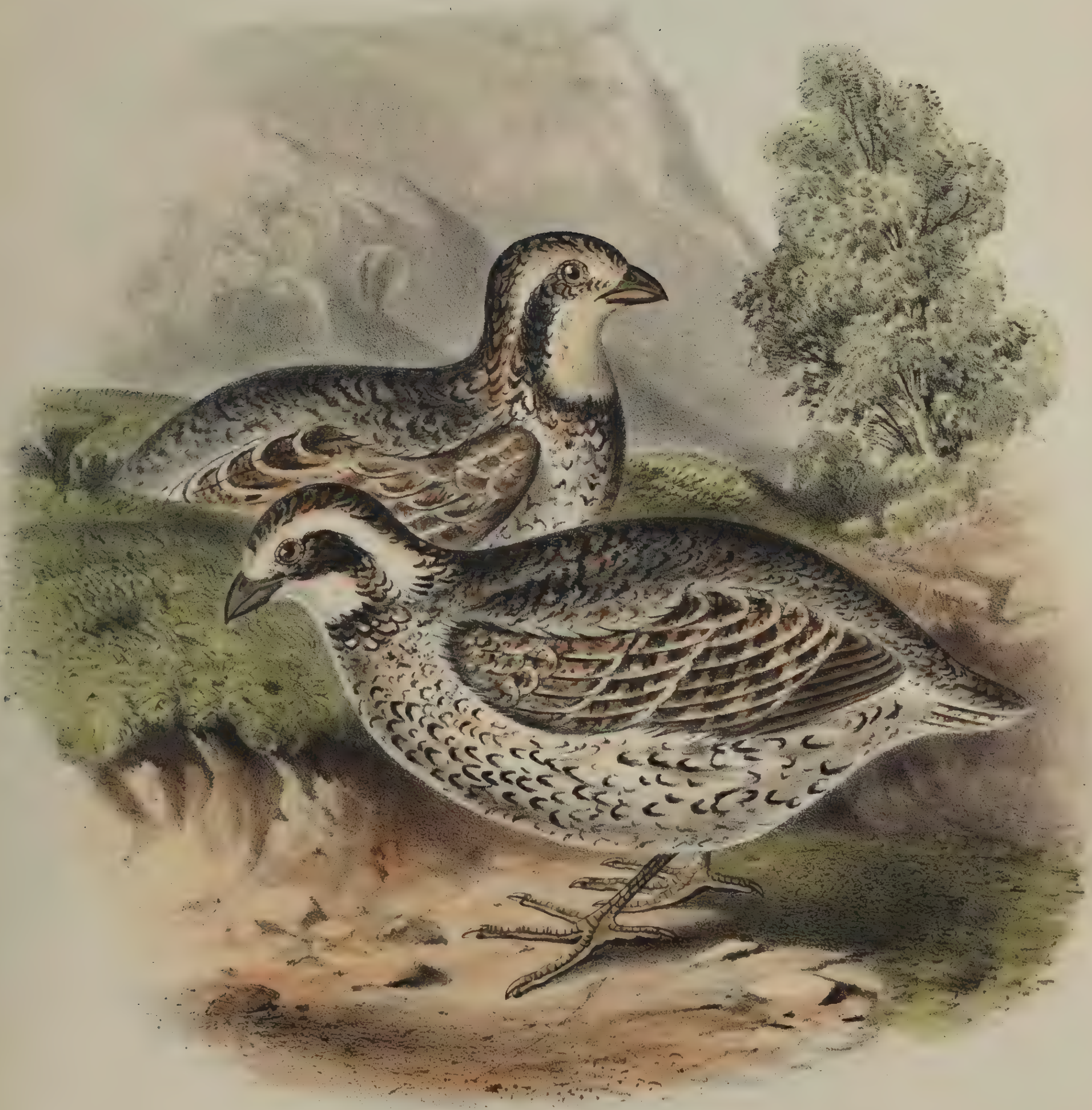


1 CYANOCITTA SORDIDA.__2 CYANOCITTA ULTRAMARINA, a Bill; b. Tail.

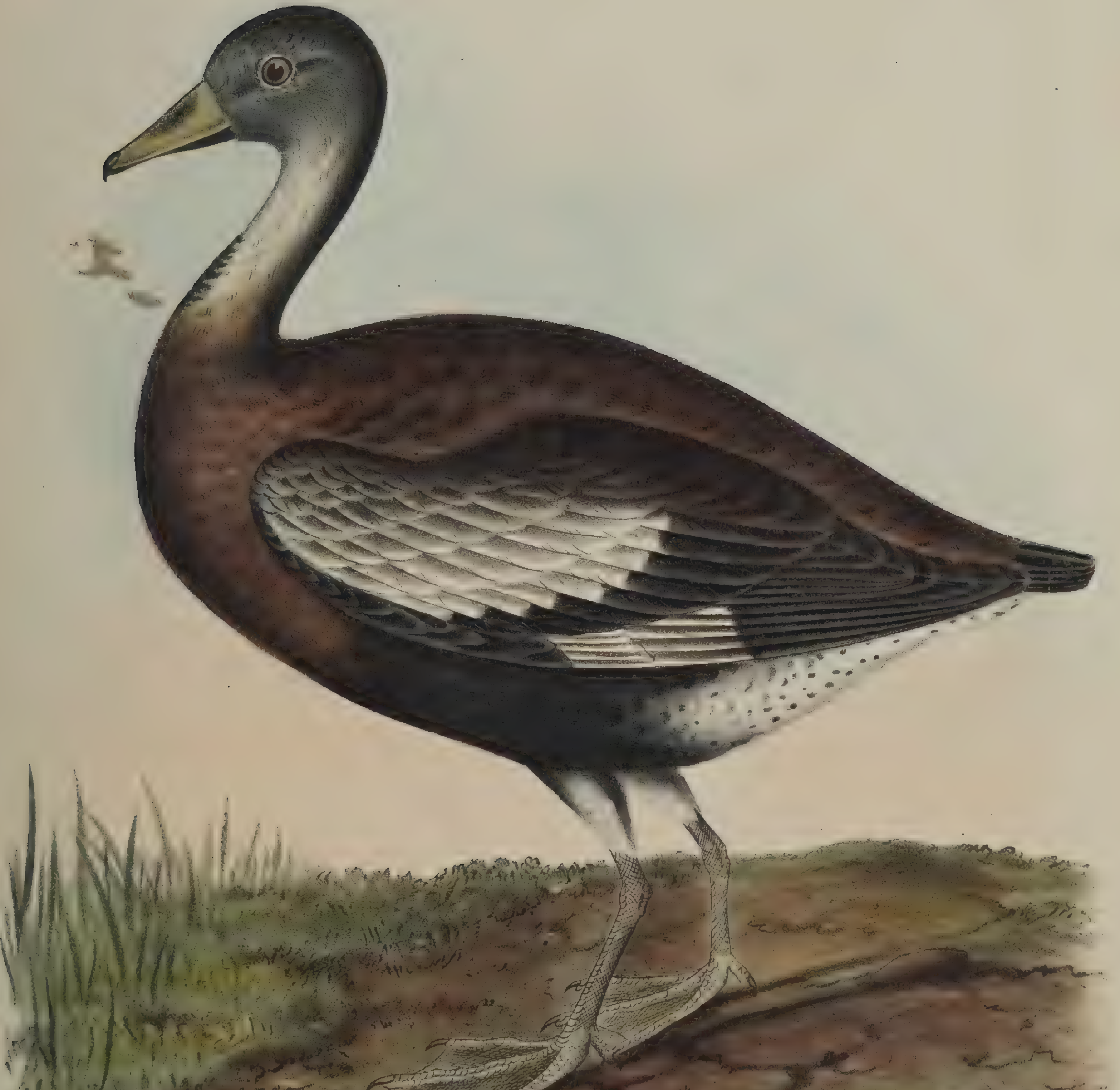


COLUMBA FLAVIROSTRIS

Lith et col Bowen & Co Philada



ORTYX TEXANUS.



DENDROCYGNA AUTUMNALIS.

UNITED STATES AND MEXICAN

BOUNDARY SURVEY,

UNDER THE ORDER OF

LIEUT. COL. W. H. EMORY,

MAJOR FIRST CAVALRY, AND UNITED STATES COMMISSIONER.

REPTILES

OF THE BOUNDARY,

BY

SPENCER F. BAIRD,

ASSISTANT SECRETARY OF THE SMITHSONIAN INSTITUTION.

WITH NOTES BY THE NATURALISTS OF THE SURVEY.

CHELONIA.[1]

1. ASPIDONECTES EMORYI, Agassiz.—Soft-shelled Turtle.

Aspidonectes Emoryi, AGASSIZ, Contributions to Nat. Hist. U. S., I, 1857, 407.

Lower Rio Grande of Texas. J. H. Clark.

2. GYPOCHELYS LACERTINA, Agassiz.—Alligator Turtle.

Gypochelys lacertina, AGASS. Cont. I, 1857, 414.
Chelydra lacertina, SCHWEIGGER, Prodromus.
Chelonura temminckii, HOLBROOK.

Lowlands of Texas.

3. OZOTHECA TRISTYCHA, Agassiz.

Ozotheca tristycha, AGASSIZ, Cont. I, 1857, 425.

Medina river, Texas. Dr. Kennerly.

4. THYROSTERNUM SONORIENSE, Agassiz.

Kinosternon sonoriense, LECONTE, Pr. A. N. Sc. VII. 1853, 184.
Thyrosternum sonoriense, AGASSIZ, Contributions, I, 1857, 428; pl. v, figs. 8–11.

Tucson and Guadalupe cañon. Dr. Kennerly.

5. PLATYTHYRA FLAVESCENS, Agassiz.

Platythyra flavescens, AGASSIZ, Contributions, I, 1857, 430; pl. v, fig. 12–15.

Texas, and valley of Gilla.

6. PTYCHEMYS MOBILENSIS, Agassiz.

Emys mobilensis, HOLBROOK, N. Am. Herp. I, 1842, 71; pl. ix.
Ptychemys mobilensis, AGASSIZ, Contributions, I, 1857, 433; pl. iii, figs. 14—16

Guadalupe mountains and Pecos river, Texas.

7. TRACHEMYS ELEGANS, Agassiz.

Emys elegans, MAXIM. Reise Nord. Am. I, 1839, 213.
Trachemys elegans, AGASSIZ, Cont. I, 1857, 435.

Brownsville, Texas.

---

[1] NOTE.—The descriptions of genera and species in the present article have been either omitted entirely, or in most cases greatly curtailed, owing to the fact that the report, as prepared, greatly exceeded the limits of space assigned.

A number of the species have been determined, or their characters better defined, by Dr. Girard and Mr. Kennicott. The contributions of those gentlemen have their name attached.—(S. F. BAIRD.)

8. CHRYSEMYS OREGONENSIS, Agassiz.

Emys oregonensis, HARLAN, Amer. Jour. Sc. XXXI, 382.
Chrysemys oregonensis, AGASSIZ, Cont. I, 1857, 440.

Guadalupe mountains, Texas.

9. XEROBATES BERLANDIERI, Agassiz.—Texas Gopher.

Xerobates berlandieri, AGASSIZ, Cont. I, 1867, 447.

Lower Rio Grande.

SAURIA.

10. ALLIGATOR LUCIUS, Cuv.

3184. Brownsville, Texas. Capt. Van Vliet.

11. SCELOPORUS CLARKII, B. & G.

Sceloporus clarkii, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 127.
Sceloporus magister, Hallow. Pr. A. N. Sc. VII, 1854, 93.

2940. Sonora. J. H. Clark.—2897. Alamo de Parras, Mex. Lt. Couch.—2964. Janos. Dr. Kennerly.—2965. Sta. Madelina. A. Schott.—2954. Los Nogales, Sonora. Dr. Kennerly.

12. SCELOPORUS SPINOSUS, Wieg.

Plate XXIX, Figs. 4—6.

Sceloporus spinosus, Wiegmann, Isis, 1828, 369—Ib. Herp. Mex. 1834, 50; pl. vii.

2968. El Paso. J. H. Clark.—2943. Indianola, Tex. J. H. Clark.—2945. Laredo to Camargo. A. Schott.

13. SCELOPORUS CONSOBRINUS, B. & G.

Sceloporus consobrinus, B. & G. Marcy's Report, 1853, 237.

4109. R. San Pedro, Tex. J. H. Clark.—2899. Janos to San Luis Springs. Dr. Kennerly.

14. SCELOPORUS TORQUATUS, Wiegm.

Agama torquata, Peale & Green, Pr. A. N. Sc. II, 131.
Sceloporus torquatus, Wiegmann, Isis, 1828, 369.

2959. Laredo to Camargo. A. Schott.

15. SCELOPORUS POINSETTII, B. & G.

Plate XXIX, Figs. 1—3.

Sceloporus poinsettii, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 126.

2952. Sonora. J. H. Clark.—2955. Limpia mountains, Tex. Dr. Kennerly.—2948. San Pedro. J. H. Clark.

16. SCELOPORUS ORNATUS, Baird.

Sceloporus ornatus, Baird, Pr. A. N. Sc. Dec. 1858.

Sp. Ch.—Dorsal scales in about 64 oblique series, with but slight carination, mucronation, and denticulation. Femoral pores, 12. A well marked black cervical collar, complete above, and margined with yellowish. Color dark green above, nearly black towards the median line. Back with small yellowish spots.

2845. Patos, Coahuila. Lt. Couch.

17. SCELOPORUS THAYERI, B. & G.

Sceloporus thayeri, B. & G., Pr. A. N. Sc. VI, Aug. 1852, 127.

2896. San Pedro, Texas, J. H. Clark.—2887. Indianola. J. H. Clark.

18. SCELOPORUS SCALARIS, Wiegmann.

Sceloporus scalaris, Wiegm. Herp. Mex. 1834, 52: tab. viii, f. 2.

2284. Los Nogales, Sonora. Dr. Kennerly.

19. SCELOPORUS MARMORATUS, Hallow.

Sceloporus marmoratus, Hallow. Pr. A. N. Sc. VI, Oct. 1852, 178.
Sceloporus delicatissimus, Hallow. Pr. A. N. Sc. VI, Oct. 1852, 178.

2916. Medina, Texas. J. H. Clark.—4116. Redmond's Ranch, Texas. J. H. Clark.

20. SCELOPORUS COUCHII, Baird.

Sceloporus couchii, Baird, Pr. A. N. Sc. Dec. 1858.

Sp. Ch.—General appearance of *S. marmoratus*, Hall. Cephalic plates smooth. Scales very small. About 80 oblique dorsal rows from head to tail. Femoral pores, 25. Color above dark green, with two lateral light stripes, separated by 18 rows of scales. Back with irregular spots. Sides with a white band from groin. An obsolete dark indigo patch on each side the belly, widely separated below. Sides of jaw banded transversely with blue and whitish. A sub-circular indigo patch in front of shoulder, surrounded by light blotches.

2904. Pesquieria Grande, Mexico. Lt. Couch.—2739. Santa Caterina, New Leon. Lt. Couch.

21. EUPHRYNE OBESA, Baird.

Plate XXVII.

Euphryne obesus, Baird, Pr. A. N. Sc. Dec. 1858.

Sp. Ch.—Width of head nearly equal to distance from nose to ear. Tail shorter than the body. General color of the young, olive green, with five broad transverse bars above from head to base of tail, and about as many on the tail; these rings yellow, dotted with red. Beneath, pea green, dotted with black. With increasing age the bands become obsolete and disappear, the general color becoming reddish olive.

2774 Fort Yuma. Major Thomas.—4172. Do. A. Schott.

22. CROTAPHYTUS COLLARIS, Holbrook.

Agama collaris, Say, Long's Exped. II, 1823, 252.
Crotaphytus collaris, Holb. N. Am. Herp. II, 1842, 72: pl. x.

2694. Sonora. Dr. Kennerly.—2710. San Antonio to El Paso. J. H. Clark.

23. CROTAPHYTUS RETICULATUS, Baird.

Crotaphytus reticulatus, Baird, Pr. A. N. Sc. Dec. 1858.

Sp. Ch.—Infra-orbital chain in a series of six or eight nearly equal plates. Scales on the gular fold much smaller than those between the fore legs. Above ashy gray, with a hexagonal reticulation of lighter; the interstices here and there dark brown. Chin and throat reticulated. Neither black collar nor light spots. More closely related to *Crotaphytus collaris* than to *Crotaphytus* (*Gambelia*) *wislizenii.*

2692. Ringgold Barracks, Texas. J. H. Clark.—2731. Laredo, Texas. A. Schott.

24. CROTAPHYTUS WISLIZENII, B. & G.

PLATE XXXI.

Crotaphytus wislizenii, B. & G. Pr. A. N. Sc. VI, April, 1852, 69.
Crotaphytus gambelii, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 126.
Crotaphytus fasciatus, HALLOWELL, Pr. A. N. Sc. VI, Dec. 1852, 207.

2704. San Antonio to El Paso. J. H. Clark.—2685. Sonora. J. H. Clark.

25. UTA STANSBURIANA, B. & G.

Uta stansburiana, B. &. G. Pr. A. N. Sc. VI, April, 1852, 69.

2745. San Antonio to El Paso. J. H. Clark.—2740. Gila desert. A. Schott.

26. UTA ORNATA, B. & G.

Uta ornata, B. & G., Pr. A. N. Sc. VII, Aug. 1852, 126.

2700. San Pedro, Texas. J. H. Clark.—2764. Eagle Pass, Texas. A. Schott.—2737. Sonora. J. H. Clark.

27. UTA ORNATA VAR. LINEARIS, Baird.

Similar in markings to the described character of *U. ornata*, but with four linear interrupted black stripes instead of transverse bands.

2759. Los Nogales, Sonora. Dr. Kennerly.

28. UTA SYMMETRICA, Baird.

Uta symmetrica, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Larger dorsal scales in four regular series, two on either side of the median smaller ones. Head short, depressed, one and a half times as wide as deep. Tail one and a half times the head and body. General color light brown above, the belly white. Sides with broad transverse bands of blackish. Size of *U. ornata.*

2760. Gila river. A. Schott.

29. UTA SCHOTTII, Baird.

Uta schottii, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Dorsal scales and size as in the last. Head pointed, narrow, nearly or quite as high as wide. General color nearly black, scarcely lighter beneath. Back with small blue spots. Tail banded laterally with the same.

3761. Santa Madelina. A. Schott.

30. UTA GRACIOSA, Baird.

Urosaurus graciosus, HALLOWELL, Pr. A. N. Sc. VII, June, 1854, 92.

4128. Colorado river, California. A. Schott.

31. DIPSOSAURUS DORSALIS, Hallowell.

Plate XXXII, Figs. 7—13.

Crotaphytus dorsalis, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 126.
Dipsosaurus dorsalis, Hall, Pr. A. N. S. VII, June, 1854, 92.

4178. Colorado desert. A. Schott.

32. CALLISAURUS VENTRALIS, Baird.

Homalosaurus ventralis, Hallowell, Pr. A. N. Sc. VI, October, 1852, 179.

2981. Colorado desert. A. Schott.

33. HOLBROOKIA MACULATA, Girard.

Holbrookia maculata, Girard, Pr. Am. Assoc. for 1850–1851, 201

2807. San Antonio to El Paso. J. H. Clark.

34. HOLBROOKIA PROPINQUA, B. & G.

Holbrookia propinqua, B. & G., Pr. A. N. Sc. VI, Aug. 1852, 126.

2671. Indianola to San Antonio. J. H. Clark.

35. HOLBROOKIA APPROXIMANS, Baird.

Holbrookia approximans, Baird, Pr. A. N. Sc. Dec. 1858.

Sp. Ch.—Similar in size and general character to *H. maculata.* Tail shorter than body. Two small vertical indigo black patches on the side of the belly, entirely visible from below, with a light blue areola. Central point of belly about opposite the middle point between the two patches. No light stripe on side of neck. Upper parts and sides gray, sprinkled with whitish. Head broad, very convex above. Hind foot about one-third the head and body.

Tamaulipas. Lt. Couch.

36. HOLBROOKIA TEXANA, B. & G.

Plate XXX.

Cophosaurus texanus, Troschel, Wiegmann's Archiv für 1850, 1852, 389.
Holbrookia texana, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 125.

2659. San Pedro, Texas. J. H. Clark.—2782. Colorado desert, California. A. Schott.

37. HOLBROOKIA AFFINIS, B. & G.

Holbrookia affinis, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 125.

2667. Sonora. J. H. Clark.

38. TAPAYA HERNANDEZII, Girard.

Tapaya hernandezii, Girard, Herp. U. S. Ex. Ex. 1858, 395.

Sp. Ch.—Head large, depressed; vertex broad, slightly inclined anteriorly, snout protruding. Cephalic plates small; occipital and temporal spines small and conical. External ears simple, granular. Mental scales very small; the series adjoining the sub-maxillar shields larger than the rest. Several folds under the throat minutely granular. Abdominal scales small, sub-rhomboid, acuminated. Terminal pores small, not continuous across the interfemoral region. Color blackish brown above, with a double or quadruple series of black, light margined spots. Beneath yellowish, unicolor, or else obscurely maculated.—(Girard.)

No. 195. Between Guadalupe mountains. Pecos. A. Schott.—Chihuahua. J. H. Clark.

39. TAPAYA ORNATISSIMA, Girard.

Phrynosoma orbiculare, Hall. Sitgreaves' Exped. 1853, 125; pl. viii, ix.
Tapaya ornatissima, Girard, Herp. U. S. Ex. Ex. 1858, 396.

No. 205. Pecos to Rio Grande, Texas. Dr. Kennerly.—No. 206. Janos to San Luis Springs. Dr. Kennerly.

40. PHRYNOSOMA CORNUTUM, Gray.

Agama cornuta, Harl. J. A. N. Sc. IV, ii, 1825, 299.
Phrynosoma cornutum, Gray, Syn. Rept. Griff. Cuv. IX, 1831, 45.

No. 121. Indianola, and 122, San Antonio. J. H. Clark.—No. 126. Eagle Pass, Texas. A. Schott.—No. 124. Los Nogales. Dr. Kennerly.

41. PHRYNOSOMA REGALE, Girard.

Plate XXVIII, Figs. 1—3.

Phrynosoma regale, Girard, Herp. U. S. Ex. Ex. 1858, 406.

Sp. Ch.—Vertex and occipital regions quite depressed. Temporal and occipital spines flat and acute, constituting a continuous series, very much inclined backwards. Labial plates proportionally well developed, unequal, and rugose. Scales under the chin small, rounded, sub-convex; largest series sub-pyramidal and acuminated. Pectoral scales moderate, and acuminated also. Lower series of sub-pyramidal scales at the periphery of the abdomen obsoletely developed. Abdominal scales sub-rhombic, not acuminated, and slightly, though distinctly, keeled. Femoral pores small and closely set together; the series from either side not continuous on the interfemoral region, over which they somewhat extend. Post-anal scales very minute. Ground color brownish olive above, back, limbs, and tail transversely maculated with black; beneath yellowish, with small black spots over the middle of the abdomen.—(Girard.)

From the valleys of the Gila and Colorado rivers.

No. 161. Gila and Colorado desert. A. Schott.

42. DOLIOSAURUS MC'CALLI, Girard.

Plate XXVIII, Figs. 4—6.

Anota mc'callii, Hallow. Pr. A. N. Sc. VI, 1852, 182.
Doliosaurus mc'callii, Girard, Herp. U. S. Ex. Ex. 1858, 400.

Sp. Ch.—Cephalic plates moderate. Occipital spines rather elongated and slender. Sub-maxillar shields very large; posterior ones spinous No external auricular aperture. Scales under the chin very small, sub-equal, with two distant longitudinal series of somewhat larger ones. Pectoral scales large, carinated, and acuminated. A triple series of sub-pyramidal scales at the periphery of the abdomen; middle one alone well developed. Abdominal scales small, slightly carinated. Femoral pores extending somewhat over the interfemoral region, though the series from either side are not continuous. Yellowish olive above, with a dorsal black line, and a double series of rounded spots on either side of the back, uniting into one along the tail; whitish yellow beneath, unicolor.—(Girard.)

No. 162. Gila and Colorado deserts. A. Schott.

43. DOLIOSAURUS MODESTUS, Girard.

Phrynosoma modestum, GIRARD, Stansbury's Expl. Great Salt Lake, 1852, 361, 365; pl. vi, figs. 4—8.
Doliosaurus modestus, GIRARD, Herp. U. S. Ex. Ex. 1858, 409.

No. 164. San Antonio to El Paso.—No. 166. Sonora. J. H. Clark.—No. 168. Los Nogales.—No. 170. Janos. Dr. Kennerly.

44. CNEMIDOPHORUS GRAHAMII, B. & G.

PLATE XXXII, FIGS. 1—6.

Cnemidophorus grahamii, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 128.

3045. San Antonio to El Paso. J. H. Clark.—3044. Los Nogales. Dr. Kennerly.

45. CNEMIDOPHORUS INORNATUS, Baird.

Cnemidophorus inornatus, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Scales on the gular fold smaller than those on the breast anteriorly, and scarcely larger than those on the middle of the chin. Scales of back tubercular and elevated. Hind feet about two-fifths the head and body. General color light greenish olive, paler beneath. No lines on the body.

3032. Pesquieria Grande. New Leon. Lieutenant Couch.

46. CNEMIDOPHORUS OCTOLINEATUS, Baird.

Cnemidophorus octolineatus, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Gular fold as in the last. Hind foot not two-fifths the head and body. Scales of back depressed. General color light greenish olive, paler beneath. Back with eight equi-distant and approximated light lines.

3009. Pesquieria Grande. New Leon. Lieutenant Couch.

47. CNEMIDOPHORUS PERPLEXUS, B. & G.

Cnemidophorus perplexus, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 128.

3020. San Pedro, Texas. J. H. Clark.—3008. Tucson. Dr. Kennerly.

48. CNEMIDOPHORUS TIGRIS, B. & G.

PLATE XXXIII.

Cnemidophorus tigris, B. & G. Pr. A. N. Sc. VI, Ap. 1852, 69.
? *Cnemidophorus marmoratus*, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 128.
Cnemidophorus undulatus, HALLOW. Pr. A. N. Sc. VII, June, 1854, 94.

3024. San Antonio to El Paso. J. H. Clark.—3036. Laredo. A. Schott.

49. CNEMIDOPHORUS GRACILIS, B. & G.

PLATE XXXIV, FIGS. 7—14.

Cnemidophorus gracilis, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 128.

3019. Castanuelas, Coahuila. Lieutenant Couch.

CNEMIDOPHORUS GULARIS, B. & G.

PLATE XXXIV, FIGS. 1—6.

Cnemidophorus gularis, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 128.
Cnemidophorus guttatus, HALLOW. Pr. A. N. Sc. VII, Oct. 1854, 192.

3010. Eagle Pass, Tex. A. Schott.—2989. Indianola, Tex. J. H. Clark.

50. HELODERMA HORRIDUM, Wiegm.

PLATE XXVI.

Heloderma horridum, WIEGMANN, Isis, 1829, 627.—IB. Herp. Mex. 1834.

2971. Sierra de la Union. Sonora. A. Schott.

51. GERRHONOTUS WEBBII, Baird.

PLATE XXIV, FIGS. 1—10. Young.

Gerrhonotus webbii, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Tail 2½ times the head and body. Scales strongly carinated. Dorsal scales in 48 transverse rows. Body encircled by 26 rows of scales, of which 12 are ventral. Hind feet longer than from snout to ear. Above leaden olivaceous brown, lighter beneath. Back with ten or twelve blackish bars, bordered in front by brownish or reddish yellow.

3205. San Diego.—3078. San Diego to El Paso. Dr. Webb.

52. GERRHONOTUS NOBILIS, Bg.

PLATE XXV, FIGS. 1—8.

Elgaria nobilis, B. & G., Pr. A. N. Sc. VI, Aug. 1852, 129.

3076. Coppermines of N. M. J. H. Clark.

53. GERRHONOTUS INFERNALIS, Baird.

Gerrhonotus infernalis, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Dorsal scales carinated, in 16 longitudinal rows; ventral in 12. Nasal plate in contact with the 2d labial only. Tail twice as long as head and body. 51 transverse rows of scales from head to tail. Color clear light olive, with 8 cross bars of dusky. Beneath yellowish, marbled faintly with dull olive. Head plain.

3090. Devil's river, Tex. Dr. Kennerly.

54. GERRHONOTUS OLIVACEUS, Baird.

Gerrhonotus olivaceus, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—No single frontal. A series of three pairs of plates between the vertical and rostral, becoming successively smaller. Two post-nasals; one loral. 39 transverse rows of scales on back from head to tail. 12 longitudinal rows above; the 6 central strongly carinated. Color dark olive green, with a series of faint dusky bars. Beneath greenish white.

3096. Near San Diego, Cal. A. Schott.

55. PLESTIODON GUTTULATUS, Hallow.

Lamprosaurus guttulatus, HALLOWELL, Pr. A. N. Sc. VI, Dec. 1852, 206.
Plestiodon guttulatus, HALLOWELL, Pr. A. N. Sc. VII, Dec. 1857, 215.

3167. San Elziario, Tex. Dr. Kennerly.

56. ANOLIS CAROLINENSIS, Cuv.

2988. Victoria, Tex. Dr. Kennerly.

57. PHYLLODACTYLUS TUBERCULOSUS, Wiegm.

PLATE XXIII, FIGS. 1—8.

Phyllodactylus tuberculosus, WIEGM. Nova Acta, K. L. C. Acad. XVII, I, 241.

No. 3208. Durango, Mex. Dr. T. H. Webb.

57. SPHAERIODACTYLUS NOTATUS, Baird.

PLATE XXIV, FIGS. 29—37.

Sphaeriodactylus notatus, BAIRD, Pr. A. N. Sc. Ph. Dec. 1858.

SP. CH.—Scales on back and sides large, equal, strongly carinated; those on belly smaller, smooth, hexagonal. Above light brownish yellow, uniformly dotted above with reddish brown, most distinct on the head, least so on the belly.

Hab.—Key West, Fla., Professor Agassiz and Prof. W. H. B. Thomas. Type No. 3215.

This species, though not an inhabitant of the regions traversed by the Boundary Commission, is introduced for the purpose of illustrating, by its figures, more fully the characters of *Stenodactylus* and *Phyllodactylus.*

58. STENODACTYLUS VARIEGATUS, Baird.

PLATE XXIII, FIGS. 9—27.—PLATE XXIV, FIGS. 11—19.

Stenodactylus variegatus, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—Head very broad. Hind foot contained six times in head and body. Above brownish yellow, ith irregular small blotches of light reddish brown, sometimes in broad transverse bands. Edges of eyelids and whole under surface opaque white.

3217. Colorado desert. A. Schott.—3211. Live Oak Creek, Tex. Dr. Kennerly.

59. PLESTIODON OBSOLETUS, B. & G.

PLATE XXV, FIGS. 9—16.

Plestiodon obsoletum, B. & G. Pr. A. N. Sc. VI, Aug. 1852, 129.

3133. Western Texas. J. H. Clark.—3117. El Paso. J. H. Clark.

60. PLESTIODON TETRAGRAMMUS, Baird.

Plestiodon tetragrammus, BAIRD, Pr. A. N. Sc. Dec. 1858.

SP. CH.—One post-nasal plate; post-frontal and inter-nasals separated by the post-nasal. Five supraorbitals. Dorsal scales of equal width. Light olive green above; sides with two yellowish lines, separated by six rows of darker olive scales. Upper labials pure yellowish. Body encircled by about 28 rows of scales. No dorsal stripe.

3139. Salado river. Dr. Kennerly.—3124. Matamoras, Mex. Lt. Couch.

61. LYGOSOMA LATERALE, Dum. Bib.

Scincus lateralis, Say. Long's Exp. II, 1823, 324.
Lygosoma lateralis, Dum. Bib. Erp. Gen. VI, 1839, 719.

3126. Indianola, Tex.—3146. San Pedro, Tex. J. H. Clark.

62. ANNIELLA PULCHRA, Gray.

Anniella pulchra, Gray, Annals & Mag. Nat. Hist. X, 1852, 440.

3190. Coast mountains, near San Diego. A Schott.

OPHIDIA.

63. CROTALUS ATROX, B. & G.

PLATE I.

Crotalus atrox, B. & G. Catal. N. A. Serpents, Jan. 1853, 5.

Nos. 258, 256, 4226, 271. Throughout Texas. Schott, Clarke, Kennerly.
Nos. 466, 467, 468. Bottoms of Gila and Colorado. A. Schott.

64. CROTALUS CONFLUENTUS, Say.

Crotalus confluentus, SAY. Long's Exped. II, 1823, 48.—B. & G. Catal. N. A. Serpents, Jan. 1853, 8.

No. 4228. Between San Antonio and El Paso. J. H. Clark.—No. 4247. Cimeron. J. H. Clark.

65. CROTALUS MOLOSSUS, B. & G.

PLATE II.

Crotalus molossus, B. & G. Catal. N. Am. Serp. Jan. 1853, 10.
Crotalus ornatus, HALLOW. Pr. A. N. Sc. VII, Oct. 1854, 192.

No. 485. Fort Webster. Copper Mines, N. M. J. H. Clark.

66. CROTALUS TIGRIS, Kennicott.

PLATE IV.

SP. CH.—Body slender; head small, very much depressed, narrow behind; nose remarkably broad and obtuse; whole outline of head nearly quadrangular. Superciliaries and frontals smooth; space between superciliaries very wide; four frontal plates, six post-frontals. Two rows of scales between sub-orbital chain (which is complete) and the labials. Labials 14 above, 13–14 below. Dorsal rows 21–23; very slightly carinated. Dorsal scales broad, rounded behind. Color yellowish ash above, with rather small indistinct dorsal brown blotches anteriorly; two posterior thirds of body banded with brown.—(KENNICOTT.)

Deserts of Gila and Colorado.
No. 471. Sierra Verde and Pozo Verde. A. Schott.

67. CROTALUS CERASTES, Hallowell.

PLATE III.

Crotalus cerastes, HALLOWELL, Pr. A. N. Sc., June, 1854, 95.

SP. CH.—Head small, angles rounded; nose obtuse, much depressed; rostral as broad as high; nostril in the middle of a single large plate. Lateral edge of superciliary plate elongated into a horn-like process directed upward over the eye. Two rows of scales between the sub-orbital series (which is complete of large scales,) and the labials. Upper labials 11–13, lower 12–13. Dorsal rows of scales 21, slightly carinated; each scale along the middle of the back with a tubercular swelling toward the centre. Crown tubercular. Entire head and upper parts of a light yellowish, with a dorsal series of small indistinct blotches, below which are several irregular rows of isolated brown dots. A narrow brown stripe extends from the orbit back over the angle of the mouth.—(KENNICOTT.)

No. 482. Colorado river, California. A. Schott. Deserts of Gila and Colorado.

68. CROTALOPHORUS CONSORS, B. & G.

Crotalophorus consors, B. & G. Catal. N. A. Serp., Jan. 1853, 12.

SP. CH.—Twenty-five rows of dorsal scales all carinated, except the two first on either side. Color olivaceous brown, with seven series of deeper blotches, one dorsal, and three on each side; the dorsal series rather small and transverse. Yellowish white line from nostril passes between the eye and pit, and along the upper labials to the angle of the mouth.—(KENNICOTT.)

No. 512. Indianola, Texas. J. H. Clark.

69. CROTALOPHORUS EDWARDSII, B. & G.

PLATE V, FIG. 1.

Crotalophorus edwardsii, B. & G. Catal. N. Am. Serp., Jan. 1853, 15.

SP. CH.—Twenty-three rows of dorsal scales, two first rows smooth. Vertical plate sub-pentagonal, tapering to an acute point posteriorly. Color light yellowish brown, with chestnut blotches lighter than *C. tergeminus* or *C. consors*. Lateral blotches proportionally small. Yellowish line from nostril to angle of mouth as in *C. consors*. No vertebral reddish line.—

No. 506. Sonora. J. H. Clark.—511. Brownsville, Texas. J. H. Clark.

70. TOXICOPHIS PUGNAX, B. & G.—Moccasin.

PLATE VI.

Toxicophis pugnax, B. & G. Catal. N. Am. Serpents, Jan. 1853, 20.

SP. CH.—No loral plate. Second labial pressed out of place and with its apex alone on the edge of the mouth. Twenty-five dorsal rows. Above light olive-brown with transverse dark zigzag bands. Cheeks uniform light colored.—(KENNICOTT.)

4262. Indianola, Texas. J. H. Clark.—4263. Eagle Pass, Texas. A. Schott.

71. ANCISTRODON CONTORTRIX, B. & G.—Copperhead.

Boa contortrix, LINN. Syst. Nat. I, 1766, 273.
Agkistrodon contortrix, B. & G. Catal. Serp. 1823, 17.

567. Indianola to San Antonio. J. H. Clark.—571. Sabinal, Texas. J. H. Clark.

72. ELAPS TENER, B. & G.—Coral Snake.

PLATE VII, FIG. 1.

Elaps tener, B. & G. Catal. N. Am. Serp. Jan. 1853, 22.

SP. CH.—Head narrow and elongated for the genus, continuous with the neck and body. Body fawn-colored (in alcohol) annulated with black and yellow. The yellow annulations separating the black and fawn color are each 2 to 2½ scales wide. Vertical and occipital plates narrow and elongated. Rostral wide and high; prefrontals sub-quadrangular.—(KENNICOTT.)

1119. San Pedro, Texas. J. H. Clark.—1127. Eagle Pass, Texas. A. Schott.—1132. Indianola, Dr. Kennerly.

73. DIPSAS SEPTENTRIONALIS, Kennicott.

PLATE VIII, FIG. 1.

SP. CH.—Body moderately slender, very much tapering anteriorly and posteriorly. Tail slender, about one-fifth the total length. Head ovoid, somewhat depressed, very large; twice as wide posteriorly as the neck. Crown flattened, concave behind the eyes; temporal regions much swollen. Snout obtusely pointed, scarcely more depressed than the vertical region. Vertical plate pentagonal elongated; broader in front, concave on the sides. Occipitals triangular, nearly as broad as long. Superciliaries small. Rostral broader than high. Nasals much larger than pre-frontals; two-thirds as high as long; emarginate above to receive the exterior edge of pre-frontals. Loral smaller than upper pre-orbital; as high as wide. Three pre-orbitals; the upper more than three times as large as either of the two lower, its inner angle produced to the vertical, separating the snperciliary and post-frontal. Two post-orbitals; upper largest. Eight upper labials; sixth and seventh four times as large as either of the three anterior ones. Ten lower labials; fifth and sixth largest. Dorsal scales in 21 to 23 rows, narrow, acute posteriorly; first lateral row much widest. Body above, with broad, lustrous, brownish black half rings on a light yellowish ground. The black rings six to eight scales wide in the middle, narrowing very much, or even rounded off, laterally, sometimes not extending quite to the abdomen. Light intervals, one or two scales wide, on the vertebral region, widening to three or four times as much near the abdomen. Abdomen and lower surface of head uniform light yellowish. An irregular light occipital ring. Upper labials and anterior part of head brownish—lighter than the dark dorsal bands.—(KENNICOTT.)

The specimen figured has the anterior sub-caudal scutellae entire, but this is a monstrosity, the sub-caudal scutellae being normally all divided in this genus.

No. 4267. Matamoras, Tam. Lieut. Couch.—No. 2288. Brownsville, Tex. Van Vliet.

74. EUTAENIA PROXIMA, B. & G.

Coluber proximus, SAY, Long's Exped. I, 1823, 187.
Eutainia proxima, B. & G. Catal. N. Am. Serp. Jan. 1853, 25.

SP. CH.—Body stouter than *E. saurita* or *E. faireyi*. Brown or blackish above. Three longitudinal stripes; the dorsal ochraceous yellow or brown, the lateral greenish white or yellow on the third and fourth rows of scales. Dorsal stripe covering one and over two half rows of scales. Lateral row of scales usually the color of the abdomen. Total length about three and one half times that of the tail. Dorsal rows 19.—(KENNICOTT.)

Texas.

75. EUTAENIA ORNATA, B. & G.

PLATE IX.

Eutainia parietalis, B. & G. Catal. N. Am. Serp. Jan. 1853, 28. (Not *Coluber parietalis*, Say.)

745. Indianola, Tex. J. H. Clark.—438. Lower Rio Grande, Tex. J. H. Clark.—768. Near San Antonio. Dr. Kennerly.

76. EUTAENIA MARCIANA, B. & G.

Eutainia marciana, B. & G. Catal. N. Am. Serpents, Jan. 1853, 36.

Sp. Ch.—Head triangular, short, but very broad posteriorly. Nose pointed; upper labials 8; 6th largest; 7th nearly as large. Body rather stout, sub-cylindrical; tail short. Prominent color light brown; a vertebral paler line and one lateral on each side on the second and third lateral rows more or less indistinct. Three series of square black spots on each side, of about 56–60 in each series, from occiput to anus. Sides of head black, with a crescentic patch of yellowish posterior to the labial plates. Three and sometimes four black vittæ radiating from the eye across the jaws. A double white spot with a black margin on the suture of occipital plates.

1417. Indianola. J. H. Clark.—1418. Eagle Pass, Tex. A. Schott.—1419. San Pedro, Rio Grande, Tex. J. H. Clark.

77. NERODIA WOODHOUSII, B. & G.

Nerodia woodhousii, B. & G. Catal. N. Am. Serp. Jan. 1853, 42.

Sp. Ch.—Form of *Nerodia erythrogaster*, but the head broader behind and more flattened above. 25 dorsal rows, all carinated. Three rather large post-orbitals; ante-orbitals narrow; loral large. Three series of quadrangular dark blotches on a brownish clay colored ground. The middle series separated by narrow white lines; the lateral by intervals of the ground color wider than themselves; the three series perfect to the head. A double yellow occipital spot. A yellow spot between the superciliary and vertical plate. A black line indistinctly seen from the posterior point of the eye to the angle of the mouth. Abdomen unspotted.—(Kennicott.)

1308. Indianola, Tex. J. H. Clark.

78. REGINA GRAHAMII, B. & G.

Plate VII, Fig. 2. Young.

Regina grahamii, B. & G. Catal. N. Am. Serpents, Jan. 1853, 47.

Sp. Ch.—Dull dark brown, with a dorsal light brown line, margined on each side by a narrow indistinct black line. A broad yellowish stripe on the first, second, and third rows, margined above with an indistinct black line on the fourth and fifth rows, and below by a distinct narrow black line on the lower fourth of the first lateral row and the extreme ends of the abdominal scutellae. Abdomen yellowish, tinged posteriorly in the old by olive, with a single central row of small sub-triangular black spots posteriorly, which disappear on the anterior third of the body, and are sometimes indistinct in young specimens. Dorsal rows of scales 19.—(Kennicott.)

1376. Rio Salado, Tex. J. H. Clark.

79. REGINA CLARKII, B. & G.

Plate X. Adult.—Plate XI, Fig. 2. Young.

Regina clarkii, B. & G. Catal. N. Am. Serp. Jan. 1853, 48.

Sp. Ch —Yellowish brown above, with four longitudinal bands of deeper brown. Abdomen dull yellow, with two clouded brown bands dotted with black. One ante-orbital. Dorsal rows of scales 19, all carinated.

1392. Indianola. J. H. Clark.—1377. Indianola. Dr. Kennerly.

80. HETERODON COGNATUS, B. & G.

Heterodon cognatus, B. & G. Catal. N. Am. Serp. Jan. 1853, 54.

Sp. Ch.—Body shorter and stouter than in *H. platyrhinos*, head strikingly larger. Vertical plate longer than occipitals. Dorsal rows of scales 23–25; outer smooth; next scarcely carinated. Scales of the rest with keels extending to their tips. Scales broader than in preceding. Disproportion between scales of the back, before and behind, not conspicuous. Light chestnut, with 20 yellow blotches from head to anus, and 9 on the tail. Beneath yellow.

1271. Indianola. J. H. Clark.

81. HETERODON NASICUS, B. & G.

Plate XI, Fig. 1.

Heterodon nasicus, B. & G. Stansbury's Rep. Great Salt Lake, 1852, 352.—Ib. Catal. Serp. 1853, 61.

Sp. Ch.—Vertical broader than long. Rostral excessively broad and high. Azygos plate surrounded behind and on the sides by many small plates (12–15.) Sometimes a second loral. Labials short and excessively high. Dorsal rows of scales 23, exterior alone smooth. A dorsal series of about 50 blotches, with four or five others on each side. Body beneath black. A narrow white line across the middle of the superciliaries; a second behind the rostral. A broad dark patch from the eye to the angle of the mouth, crossing the last two labials.

Fort Webster, and 1260, Sonora. J. H. Clark.—1249. Eagle Pass. A. Schott.—1262. Copper Mines. J. H. Clark.

82. PITYOPHIS BELLONA, B. & G.

Churchillia bellona, B. & G. Stansbury's Report, 1852, 350.
Pituophis bellona, B. & G. Catal. N. Am. Serp. Jan. 1853, 66.
Pituophis affinis, Hallowell, Pr. A. N. Sc. VI, 1852, 181.

Sp. Ch.—Head broad behind, tapering to the snout. Snout rather pointed, but less so than *P. sayi*; elevated. Crown flattened between the eyes and posteriorly. Vertical plate broad anteriorly; elongated and narrow posteriorly. Ante-orbitals two, sometimes one. Post-orbitals three or four. Frequently a supplemental plate before the vertical. Dorsal rows of scales 29 to 35, the seven outer rows smooth. Head spotted with black; transverse frontal bar extending from one orbit to the other, well marked; the oblique post-ocular vitta rather narrow. Color of the body whitish yellow. A dorsal series of 45 to 65 sub-quadrate blotches from head to anus, transversely elongated posteriorly; three or four smaller series on each side. The lateral blotches are longitudinally elongated near the head, and vertically elongated posteriorly where they form a series of jet black vertical bands. There are 10 or 15 black bands on the tail. Abdomen yellow, with an external series of black spots on each side.—(Kennicott.)

1542. 1543. Through Texas. J. H. Clark.—1546. San Bernardino to Rio San Pedro, Mexico. Dr. C. B. Kennerly.

83. ARIZONA[1] ELEGANS, Kennicott.

Plate XIII.

Sp. Ch.—Body rather more slender than in *Pityophis sayi* and *P. bellona*, and head narrower; otherwise bearing a general resemblance in form to these and other species of *Pityophis*, especially in the protruding and recurved nostril. The tail forms nearly one-sixth of the total length. Head depressed anteriorly, arched, and much more elevated posteriorly, where it is not much wider than high, nor much wider than the neck. Vertical plate sub-pentagonal, broad in front, tapering, and very acute posteriorly. Occipitals large, perfect, longer than the vertical. Superciliaries small. Pre-frontals of greater longitudinal extent than post-frontals, separated for more than two-thirds of their length by the apex of the nostril, the anterior angle extending down in front of the pre-nasal to below the level of the nostril. Post-nasal more than twice as large as pre-nasal. Loral very narrow, as long as both nasals together, and longer than the post-frontals. One ante-orbital, sometimes a second very small one below; two post-orbitals of about equal size. Two narrow and much elongated temporal shields just behind the post-orbitals, entirely filling the space between the seventh upper labial and the occipital; behind this, small scale-like temporal shields. Eight upper labials, seventh twice as large as any other. Fourteen lower labials, seventh largest. Dorsal scales in 29 to 31 rows all perfectly smooth; central rows not much smaller; outer row largest, but not as high as long.

---

[1] Genus Arizona, Kennicott.—Size large. Body sub-cylindrical, deeper than wide. Head ovoid rather narrow. Snout obtusely pointed, projecting beyond the lower jaw. Eye small. Cleft of mouth curved. Cephalic plates normal. Pre-frontals elongated longitudinally; post-frontals elongated transversely. Pre-frontals extending down in front of nostrils. Rostral large, and protruding apex turned back between pre-frontals. Nostril between two plates; anterior smallest. A narrow loral as long as the post-frontals. One or two pre-orbitals, two post-orbitals. Dorsal scales all perfectly smooth, in about 29 to 31 rows. Post-abdominal scutella entire; sub-caudal all biped.

In its general aspect this genus somewhat resembles *Pityophis*, from which it differs widely, however, in its single pair of post-frontals, smooth scales, and different nasals, loral, pre-frontals, &c.—(Kennicott.)

Body whitish yellow above, with a dorsal series of transversely quadrate light olive brown blotches and two smaller lateral series on each side. Abdomen uniform clear whitish. The dorsal series of blotches are indistinctly edged with blackish; they cover three or four scales longitudinally and twelve or thirteen rows transversely, and are separated by regular intervals of one and a half scales of the ground color. The lateral blotches become more or less indistinct in age from a dark suffusion over the ground color. Each dorsal scale occupying a dark blotch is edged with lighter. In the young, the head above is light brown, with a blackish bar across the post-frontals and through the eyes to the angles of the mouth; there is also a dark blotch below the eye and some smaller ones on the crown posteriorly. In older specimens these markings become obsolete, leaving the head uniform light glossy olive brown.—(Kennicott.)

1722. Rio Grande. A. Schott.—4266. Between Arkansas and Cimarron. J. H. Clark.

84. SCOTOPHIS LINDHEIMERI, B. & G.

Scotophis lindheimeri, B. & G. Catal. N. Am. Serp. Jan. 1853, 74.

Sp. Ch.—Head broader behind and more pointed on the snout than in *S. alleghaniensis;* snout more narrow and elevated. Vertical plate as broad anteriorly as long; 27 to 29 dorsal rows, central rows distinctly carinated. A dorsal series of dark leaden brown or amber brown quadrangular blotches, with an elongated lateral series on each side. Intermediate space brownish yellow. Abdomen nearly all yellow.—(Kennicott.)

Indianola, Texas. J. H. Clark.

85. SCOTOPHIS EMORYI, B. & G.

Plate XII.

Scotophis emoryi, B. & G. Catal. N. Am. Serp. Jan. 1853, 157.

Sp. Ch.—Head narrow, elongated, widening suddenly behind the eyes. Snout elongated, narrow, elevated, and obtuse; outline anterior to the eyes sub-quadrangular. Crown flattened. Eyes very large. Vertical plate much longer than wide, narrow posteriorly, much wider in front. Superciliaries narrow. Loral large, trapezoidal, acutely angled behind. Dorsal rows 25 to 27; carination of scales very faint, barely perceptible on the central rows. Above ash-grey with a dorsal series of transverse brown blotches, on each side of which are two others of smaller size; indistinct traces of a third. A frontal brown vitta passing back through the eye and crossing the angle of the mouth on to the side of the neck. Two blotches on the upper labials which are not margined with black.—(Kennicott.)

2257. Howard Springs, Texas. J. H. Clark.—1716. Pecos to Rio Grande. Dr. C. B. Kennerly.

86. OPHIBOLUS BOYLII, B. & G.

Ophibolus boylii, B. & G. Catal. N. A. Serp. Jan. 1853, 82.
Coronella balteata, Hallowell, Pr. A. N. Sc. Jan. 1853, 236.

Gila desert. A. Schott.

87. OPHIBOLUS SPLENDIDUS, B. & G.

Plate XIV.

Ophibolus splendidus, B. & G. Catal. N. A. Serp. Jan. 1853, 83.

Sonora. J. H. Clark.—1851. Tucson, Sonora. A. Schott.

88. OPHIBOLUS SAYI, B. & G.

Coronella sayi, Holbrook, N. Am. Herp. III, 1842, 99.
Ophibolus sayi, B. & G. Catal. N. Am. Serp. 1853, 84.

1699. Indianola, Texas. J. H. Clark.

89. GEORGIA OBSOLETA, B. & G.

Plate XV.

Georgia obsoleta, B. & G. Catal. N. Am. Serp. Jan. 1853, 158. (Not *Coluber obsoletus*, of Say.)

1862, 1864. Eagle Pass and Lower Rio Grande, Texas. A. Schott and J. H. Clark.

90. BASCANION FLAVIVENTRIS, B. & G.

Coluber flaviventris, Say, Long's Exped. II, 1823, 185.
Bascanion flaviventris, B. & G. Catal. N. Am. Serp. Jan. 1853, 96.

Indianola to San Antonio. J. H. Clark.

91. MASTICOPHIS SCHOTTI, B. & G.

Plate XVIII.

Masticophis schotti, B. & G. Catal. N. Am. Serp. 1853, 160.

1972. Eagle Pass, Texas. A. Schott.

92. MASTICOPHIS ORNATUS, B. & G.

Plate XVII.

Masticophis ornatus, B. & G. Catal. N. Am. Serp. Jan. 1853, 102.

1971. San Antonio to El Paso. J. H. Clark.—1970. Howard Springs, Texas. A. Schott.

93. MASTICOPHIS TESTACEUS, B. & G.

Plate XVI.

Coluber testaceus, Say, Long's Exped. II, 1853, 48.
Psammophis flavigularis, Hallow. Pr. A. N. Sc. VI, 1852, 178.
Masticophis flavigularis, B. & G. Catal. N. Am. Serp. 1853, 99.

Sp. Ch.—Dorsal rows 17. Tail one-fourth the length of body. In alcohol light dull yellow, tinged with brown above. Beneath, two longitudinal series of blotches distinct anteriorly; when the epidermis is removed the whole animal appears of a soiled white. In life there is a tinge of rose color, and in some specimens the whole body is said to be nearly of a brick red.

Texas generally.

1990. Indianola. A. Schott.—2002. Presidio del Norte. J. H. Clark.—2118. Brownsville, Texas. J. H. Clark.

94. SALVADORA GRAHAMIAE, B. & G.

Plate V, Fig. 2.

Salvadora grahamiæ, B. & G. Catal. N. Am. Serp. Jan. 1853, 104.

2081. Sonora. J. H. Clark.—2080. Presidio del Norte. J. H. Clark.—2082. Sonora. A. Schott.—2083. Northern Sonora. Dr. C. B. Kennerly.

95. LEPTOPHIS MAJALIS, B. & G.

Leptophis majalis, B. & G. Catal. N. Am. Serp. Jan. 1853.

1435. Castroville, Texas. Dr. C. B. Kennerly.—Indianola, Texas. J. H. Clark.—143. Eagle Pass, Texas. A. Schott.

96. SONORA SEMIANNULATA, B. & G.

Plate XIX, Fig. 3.

Sonora semiannulata, B. & G. Catal. N. Am. Serp. Jan. 1853, 117.

3109. Sonora. J. H. Clark.

97. RHINOCHILUS LECONTII, B. & G.

Plate XX.

Rhinochilus lecontii, B. & G. Catal. N. Am. Serp. Jan. 1853, 120.

2014. Pecos, Texas. A. Schott.

98. LAMPROSOMA OCCIPITALE, Hallowell.

Plate XXI, Fig. 1.

Rhinostoma occipitale, Hallowell, Pr. A. N. Sc. VII, June, 1854, 95.
Lamprosoma occipitale, Hallow. Pr. A. N. Sc. VIII, Dec. 1856, 310.

Sp. Ch.—Body moderately stout, tapering slightly toward the neck and considerably toward the tail, which is about one-sixth of the total length, slender, and narrowing suddenly at its base. Vertical proportionally large, tapering posteriorly. Superciliaries scarcely two-thirds as long as the vertical. Occipitals nearly as broad as long. Anterior edge of pre-orbitals concave, to receive the convex upper edge of the nasal. Loral elongated; exceedingly narrow. Orbitals small; pre-orbital quadrangular, but little higher than wide; upper post-orbital much the largest. Upper labials eight; seventh largest. Lower labials seven; fourth largest. Dorsal scales rather short and broad, disposed in fifteen rows; those of the lateral rows about as high as long; the central rows not very much smaller; the first lateral row no larger than the second and third. In the alcoholic specimen the ground color above is light greenish yellow, tinged with dull pinkish along the vertical region; below whitish yellow, with narrow black rings entirely around the body. In life, the whole ground color above may have been pinkish. The black rings are two scales wide, and separated by regular intervals of five or six scales of the ground color throughout. The first three anterior rings do not reach the abdomen, but behind this to the tip of the tail all pass completely around the body. They are narrowest on the first lateral rows of scales and widest on the middle of the abdomen and vertebral region. On the head is an occipital crescentic blotch, passing from one eye to the other back through the middle of the occipitals.—(Kennicott.)

The specimens described are with some hesitation referred to *Lamprosoma occipitale.* Dr. Hallowell's type of this species differs in having only transverse dorsal bands, which do not reach the abdomen, except on the tail, in place of the perfect annulations; and these bands are only one and one-half scales wide and separated by three and a half or four scales of the ground color; the occipital crescentic blotch is broader, but does not extend to the eyes. Should these characters be permanent, the specimens described above must be referred to another species, which might with propriety be called *Lamprosoma annulatum.*

No. 2105–6. Colorado desert. A. Schott.

99. LAMPROSOMA EPISCOPUM, Kennicott.

Plate VIII, Fig. 2.

Sp. Ch.—Form tapering very little toward the neck—which is not much narrower than the head—and moderately tapering toward the tail. The tail forms about one-fifth of the total length. Head rather depressed; crown flattened posteriorly. Snout broad, rounded, and depressed. Vertical a third longer than wide; scarcely tapering behind; acute posteriorly, and usually slightly concave on the sides. Superciliaries and occipitals short and narrow. Nasal elongated; nostril very small in the centre of the plate. Loral elongated; not half as large as the ante-orbital, which is itself small and vertically elongated. Post-orbitals of nearly equal size. Rostral subpentagonal; the apex acute and turned back upon the crown, entering slightly between the pre-frontals. Seven upper labials; fourth, fifth, and sixth largest and nearly equal in size, seventh very small. Lower labials seven; the fourth very much the largest. The dorsal scales in fifteen rows; they increase regularly in size from the central rows, which are much the smallest, to the first lateral row, which is higher than long. The color of the entire upper parts of head and body is uniform light olive brown, tinged with green; but on close inspection each scale is seen to be very minutely mottled with black toward the centre, and upon stretching the skin the base of each scale is black. The abdomen is uniform whitish green. In a specimen from Rio Seco the exposed base of each scale is black, giving the body somewhat of an indistinctly mottled appearance even when the skin is not stretched. The colors become lighter after soaking long in alcohol, and the black at the bases of the scales becomes more or less effaced.—(Kennicott.)

2042. Eagle Pass. A. Schott.—2045. San Antonio to Rio Grande. Dr. Kennerly.

100. DIADOPHIS REGALIS, B. & G.

Diadophis regalis, B. & G. Catal. N. Am. Serp. Jan. 1853, 115.

Sp. Ch.—Form stout. Head very short, broad behind. Eye very small. Vertical plate broad, tapering posteriorly. Dorsal scales in 17 rows. Body above uniform greenish ash; beneath light yellow, with scattered black spots. No occipital ring.—(Kennicott.)

2062. Sonora. J. H. Clark.—2064. Eagle Springs, Texas. J. H. Clark.

101. DIADOPHIS DOCILIS, B. & G.

Plate XXI, Fig. 3.

Diadophis docilis, B. & G. Catal. N. Am. Serp. Jan. 1853, 114.

Sp. Ch.—In form, the most slender of the genus. Head rather broad behind; snout narrow; crown arched posteriorly. Eyes small. Vertical plate pentagonal, elongated, tapering but little posteriorly.

Dorsal scales proportionally small, disposed in 17 rows, the outer row scarcely largest. Color above uniform ash gray; beneath light yellow, sparsely spotted all over with black. Head dark brown above; below yellow, thickly mottled with black. As in all the western species, the color of the abdomen deepens into reddish towards the tip of the tail. A yellowish white occipital ring 2½ to 3 scales in width.—(KENNICOTT.)

2074. Devil's river, Texas. J. H. Clark.—2066. Tucson, Sonora. A. Schott.—2078. Pecos to Rio Grande. Dr. C. B. R. Kennerly.

102. TAENIOPHIS IMPERIALIS, B. & G.

PLATE XIX, FIG. 1.

Taeniophis imperialis, (B. & G.) GIRARD in Gilliss' Chile, II, 1855, 215. (Named, not described.)

SP. CH.—Form tapering anteriorly and posteriorly. Tail continuous with the body. Head proportionally narrow posteriorly, and broad on the nose; snout rounded. Rostral gibbous, twice as broad as high, the apex below the anterior frontals. Loral as high as long, and more than half as large as the anterior frontals, which are themselves about one-third the size of the post-frontals. The vertical is pentagonal, narrow, and elongated, scarcely wider anteriorly, the acute posterior point entering between the occipitals; one ante-orbital large, vertically elongated, broader above; two post-orbitals small, upper largest. Dorsal scales smooth, in 19 rows; central scales narrow and acute, outer rows much broader, especially the first. Body above deep purplish black, with two dorsal stripes of yellowish brown from head to tip of tail, and separated by a narrower vertebral line of the ground color. Head black above, with two narrow yellow lines from the nostrils to the sides of the occiput, crossing the upper angle of the orbit. Upper labials and under part of head yellowish, minutely mottled with black. Ground color of the back extending on to the ends of the abdominal scutellae. Middle of abdomen uniform light yellowish in the alcoholic specimen; said to be bright red in life.—(KENNICOTT.)

2060. Brownsville, Texas. Capt. Van Vliet.

103. TANTILLA GRACILIS, B. & G.

Tantilla gracilis, B. & G. Catal. N. Am. Serp. Jan. 1853, 132.

2040. Indianola, Texas. J. H. Clark.—2038. Eagle Pass, Texas. A. Schott.

104. TOLUCA[1] LINEATA, Kennicott.

PLATE XXI, FIG. 2.

SP. CH.—Body exceedingly stout. Tail about one-sixth of the total length. Head short, wedge-shaped, scarcely wider than the neck. Snout much depressed, acutely pointed, and projecting beyond the lower jaw. Crown arched throughout. Vertical plate very large, sub-hexagonal, the anterior extremity elongated in a narrow process to the anterior frontals, thus widely separating the post-frontals. Occipitals nearly as broad as long. Superciliaries small. Rostral proportionally large, the apex obtusely pointed, and its centre forming the acute point of the nose. Nasal pentagonal, much elongated, pointed posteriorly. One small sub-pentagonal ante-orbital, as long as high; two post-orbitals, upper slightly largest; seven upper labials, first much smaller than the second and succeeding ones; lower labials, six. Dorsal scales in 17 rows. The scales of the first lateral rows are higher than long; those of the central rows narrower; the outer row largest. Color above uniform light brownish ash, with three imperfect longitudinal blackish stripes, each on a single row of scales.

[1] GENUS TOLUCA, Kennicott.—Size small. Body very stout, sub-cylindrical, deeper than wide. Tail short and thick. Head short and broad, wedge-shaped, almost continuous with the body. Snout pointed and projecting. Cephalic plates normal. Vertical large, sub-hexagonal, the elongated anterior angle separating the post-frontals. Occipitals shorter than vertical. Rostral turned back upon the crown, and occupying the entire point of nose. A single elongated nasal; no loral. Dorsal scales smooth. Post-abdominal scutella divided; sub-caudal all divided.

The vertebral stripe the most distinct; the lateral stripes obsolete on the fourth lateral row on each side. The stripes are formed by scales with the bases black, and the tips of the ashy ground color; the scales involved by the vertebral stripe have their tips even lighter than the ground color. Each dorsal scale appears, on close examination, to be minutely mottled with blackish, and when the skin is stretched the covered base of each scale is seen to be black. Head brownish ash, minutely mottled with blackish; labials lighter. Abdomen uniform greyish white.—(KENNICOTT.)

2103. Valley of Mexico. Dr. T. Potts.

105. RENA DULCIS, B. & G.

Rena dulcis, B. & G. Catal. N. A. Serp. Jan. 1853, 143.

San Pedro to Comanche Springs. J. H. Clark.

BATRACHIA.

105. BUFO AMERICANUS, Leconte.

PLATE XXXIX, FIGS. 1—4.

Bufo americanus, (LEC. MSS) HOLBROOK, N. Am. Herp. V, 1842, 17; pl. iv.

SPEC. CHAR.—Head above, grooved; a ridge from the snout to the occiput, hence at almost right angle to the tympanum. The ridge from either side is slightly diverging from before backwards. Skin upon the head thick, and adhering to the skull. Parotids sub-reniform. Tympanum well developed. A subgular vocal sac in the male sex. Limbs large and stout. First finger larger than the second. A large carpal corneous disk, and a small one. No membranous fold at the inner lower edge of the tarsus. Toes semi-palmated. Two metatarsal tubercles, the internal large and spade-shaped, the external small and sub-conical. Large papilla on the back. Greenish or yellowish brown above, with scattered black patches or spots. A vertebral fuscous vitta or streak. Two black patches under the eye, occasionally spotted about the nostrils and over the jaws. Beneath dirty yellowish.—(GIRARD.)

Atlantic States.

106. BUFO PUNCTATUS, B. & G.

PLATE XXXIX, FIGS. 5—7.

Bufo punctatus, B. & G. Pr. A. N. Sc. VI, Oct. 1852, 173.

SPEC. CHAR.—Upper surface of the head flattened, with a sub-orbicular row of granules. Tip of the snout prominent. A blunt granular ridge along the sides of the upper surface. Parotid glands rounded or sub-triangular. Tympanum well developed and eventually elliptical. Eyes large. Tongue elliptical. First finger longer than the second. Two carpal disks. No membranous fold along the inner edge of the tarsus. Toes very slightly webbed at the base. Upper surface of the body covered with minute granules. Two small metatarsal tubercles. Above yellowish brown, with minute black dots over the head, body, and limbs. Granules reddish. Beneath yellowish white, with scattered minute blackish dots under the head and over the chest.—(GIRARD.)

Western Texas. J. H. Clark.

107. BUFO NEBULIFER, Grd.

PLATE XL, FIGS. 1—4.

Bufo granulosus, B. & G. Pr. A. N. Sc. VI, Oct. 1852, 173.
Bufo nebulifer, GIRARD, Pr. A. N. Sc. VII, May, 1854, 87.

SPEC. CHAR.—Upper surface of head deeply excavated or concave; concavity bordered with conspicuous ridges. Skin very thin and firmly adhering to the skull. Parotid small; eyes and tympanum rather large. Tongue moderate, broadest posteriorly. Upper jaw emarginated. Inner finger much longer than the second, which is longer than the fourth. Two well developed carpal disks. No membranous fold along the tarsus. Toes semipalmated; two metatarsal tubercles. Palm of hands and sole of feet tuberculous. Yellowish brown with a dorsal broad streak of the same tint. An interocular black bar on either side of the dorsal streak extending to the whole length of the body. Sides maculated; upper part of limbs barred. Beneath unicolor in the adult, spotted in the young.—(GIRARD.)

Quite abundant along the shores of the Gulf of Mexico, north and south of the Rio Grande del Norte, (Rio Bravo.)

108. BUFO SPECIOSUS, Grd.

PLATE XL, FIGS. 5—10.

Bufo speciosus, GIRARD, Pr. A. N. Sc. VII, May, 1854, 86.

SPEC. CHAR.—Head moderate; its upper surface smooth and even, else showing slight traces of ridges or crests. Snout sub-truncated and rounded; nostrils sub-terminal. Mouth large; upper jaw slightly emarginated. Tongue small, elongated, free posteriorly upon the fourth of its length. A sub-gular vocal bladder in the male sex. Tympanum of medium size. Parotids sub-rhomboid, of stoutish appearance. Limbs of moderate development. First finger much longer than the second, which is equal to the fourth. A large sub-circular carpal disk. Toes semipalmated. Two metatarsal, spade-shaped processes; the innermost being much the largest. A membranous fold at the inner lower edge of the tarsus. Skin above covered with papillae of moderate development, and with small warts beneath. Color above greenish brown, maculated; no dorsal lighter vitta or streak. Beneath greenish or yellowish white, unicolor.—(GIRARD.)

Lower Rio Grande.

109. BUFO ALVARIUS, Grd.

PLATE XLI, FIGS. 1—6.

SPEC. CHAR.—Upper surface of head nearly plane upon its middle region; orbits bordered by a low and rounded off ridge; its skin being thin and adhering to the skull. Parotids well developed and subreniform. Eyes and tympanum rather large also. Tongue elongated, broadest posteriorly. Upper jaw emarginated. Two large carpal callosities. A membranous fold at the inner lower edge of the tarsus. Toes palmated; two metatarsal tubercles. Palms and soles coarsely granular. Upper surface of body exhibiting numerous glandular tubercles; large pustular swelling upon the thighs. Color uniformly dark green.—(GIRARD.)

Valley of Gila and Colorado. A. Schott.

110. BUFO HALOPHILA, B. & G.

PLATE XLI, FIGS. 7—12.

Bufo halophila, B. & G. Pr. A. N. Sc. VI, Feb. 1853, 301.

SPEC. CHAR.—Upper surface of head without either crests or grooves. Skin thick and adhering to the skull. Snout rounded. Parotids of medium size. Eyes moderate. Tympanum small. Tongue lanceolated; broadest posteriorly. Upper jaw emarginated. Inner finger longer than the second. Two carpal disks. A membranous fold along the inner edge of the tarsus. Toes semipalmated; two metatarsal tubercles. A narrow yellowish dorsal streak or vitta. Ground color greenish yellow, with numerous black spots and dots distributed all over the upper surface and sides of the body, head, and limbs. Beneath unicolor, of a dingy yellow.—(GIRARD.)

Coast of California.

111. BUFO INSIDIOR, Grd.

PLATE XLI, FIGS. 13—18.

Bufo insidior, GIRARD, Pr. A. N. Sc. VII, May, 1854, 88.

SPEC. CHAR.—Upper surface of head plane and smooth. Snout sub-acute, protruding. Mouth moderate; upper jaw slightly emarginated. Tongue elongated, tapering towards both extremities. Tympanum inconspicuous. Parotids large and elongated, obliquely situated across the shoulders. Limbs moderate

First finger equal to the second in length. A carpal disk and a tubercle. Toes slightly webbed at their base. Two metatarsal tubercles. No membranous fold at the inner lower edge of the tarsus. Skin papillous above, warty beneath. Above of a bluish slate tint with black markings. Beneath unicolor, of a dingy yellow tint —(GIRARD.)

Chihuahua and Sonora.

112. BUFO WOODHOUSII, Girard.

Bufo dorsalis, HALLOWELL, Pr. A. N. Sc. VI, 1852, 181. (Not of Spix.)
Bufo woodhousii, GIRARD, Pr. A. N. Sc. VII, May, 1854, 86.

Sonora.

113. BUFO COGNATUS, Say.

Bufo cognatus, SAY, Long's Exped. II, 1823, 190.

Texas.

114. BUFO DEBILIS, Girard.

Bufo debilis, GIRARD, Pr. A. N. Sc. VII, May, 1854, 87.

Lower Rio Grande.

115. RANA CATESBIANA, Shaw.

Bull Frog.

Rana catesbiana, SHAW, Gen. Zool. Amphibia, 1802, 106; pl. xxxiii.
Rana pipiens, HARLAN, Sill. Am. Jour. X, 1825, 62.—HOLBROOK, N. Am. Herp. IV, 1842, 77; pl. xviii. (Not of Linnaeus.)

San Antonio, Texas. Dr. Kennerly.

116. RANA MONTEZUMAE, Baird.

PLATE XXXVI, FIGS. 1—6.

Rana montezumae, BAIRD, Pr. A. N. Sc. VII, April, 1854, 61.

SP. CH.—Head as wide as long. Body generally smooth, except pustulation on the sides and sometimes above. No fold of skin, either on the sides or around the tympanum. Tympanum about size of eye; but little variation with sexes. Large vocal vesicles on each side behind jaws. Tongue broad, cornua short. Palatine protuberances close together. Toes not webbed beyond middle of last phalanges on the external sides. Color purplish olive above, grayish below, with crowded spots or vermiculations of whitish all over the body. In young specimens, rounded, areolated, dark blotches on the back and fore leg. Size, that of *Rana pipiens* of Holbrook. (*R. catesbiana.*)

City of Mexico. Major W. Rich.

117. RANA BERLANDIERI, Baird.

PLATE XXXVI, FIGS. 7—10.

SP. CH.—Size large. Body stout, robust. Eye distant not quite 1½ times its diameter from tip of snout, and contained 2⅔ times in the length of jaw from rictus. Tympanum two-thirds the diameter of the eye. A vocal vesicle on each side of the head. A glandular fold on each side the jaw, and another one broad and depressed on each side of the body. Between these is one pair of ridges along the coccyx;

several pairs more interrupted anterior to it. Skin corrugated and irregular, quite pustular in some specimens. Feet webbed from the bulb of the toes; excavated on the inner edges; last joint of longest free. Femur about half the length of body, shorter than the tibia.

Color above greenish olive, with distant sub-circular blotches of darker, scarcely areolated in the preserved specimens. Beneath yellowish white, with brown mottlings on the throat. An indistinct whitish line on the side of the head, especially in the young; the lateral ridge bronzed.

Southern Texas generally.

118. RANA AREOLATA, B. & G.

Plate XXXVI, Figs. 11, 12.

Rana areolata, B. & G. Pr. A. N. Sc. VI, Oct. 1852, 173.

Indianola. J. H. Clark.

119. SCAPHIOPUS COUCHII, Baird.

Plate XXXV, Figs. 1—6.

Scaphiopus couchii, Baird, Pr. A. N. Sc. VII, April, 1854, 62.

Sp. Ch.—Outer toe but little shorter than the third. Hand nearly as long as the forearm. Above grayish ash in alcohol, with dark markings. A dark line down the back from each orbit. Beneath white; length about one inch or more. Older specimens apparently more greenish.

Lower Rio Grande. Lieutenant Couch.

120. ACRIS CREPITANS, Baird.

Plate XXXVII, Figs. 14—17.

Hylodes gryllus, DeKay, N. Y. Zool. III, 1842, 70; pl. xxii. (Not of Leconte.)
Acris crepitans, Baird, Pr. A. N. Sc. VII, April, 1854, 59.

Sp. Ch.—Brownish above. The median region of head and body above bright green; a dark triangle between the eyes. Three oblique blotches on the sides, nearly equidistant; the first behind the eye, the last on the flanks and running up on the back; all usually margined with lighter. A narrow white line from the eye to the arm. Beneath yellowish white. Inferior face of thigh plain. Tibia a little more than half the length of the body; foot rather smaller. Head rather obtuse, scarcely longer than broad. Web of hind foot extending to the penultimate articulation of the fourth toe.

Indianola, Texas. J. H. Clark.—New Braunfels. F. Lindheimer.

121. HELOECETES CLARKII, Baird.

Plate XXXVII, Figs. 4—9.

Heloecetes clarkii, Baird, Pr. A. N. Sc. VII, April, 1854, 60.

Sp. Ch.—Snout acute, projecting. Extremities somewhat dilated. Tibia half the distance between eye and anus. Foot but little longer, not nearly half the length of body. Above grayish brown or ash, with distinct large circular blotches. A dark band from snout through eye and tympanum down the sides, and a whitish line on the side of jaw. Body about one inch long

Indianola, Texas. J. H. Clark.

122. HYLA SEMIFASCIATA, Hallow.

Hyla semifasciatum, Hallow. Pr. A. N. Sc. VIII, Dec. 1856, 306.

Indianola. J. H. Clark.

123. HYLA EXIMIA, Baird.

Plate XXXVIII, Figs. 8—10.

Hyla eximia, Baird, Pr. A. N. Sc. VII, April, 1854, 61.

Sp. Ch.—Smooth above. Tibia not half the total length of body. Hind foot not longer than arm from elbow. Bluish above, with two dark longitudinal stripes; beneath white. A dark band from the eye along the sides, margined above and below by a white line, the latter reaching only to the arm, behind which the outline of the dark band is indistinct. Legs not banded. Body about an inch long.

City of Mexico. Major Rich.

124. HYLA VANVLIETII, Baird.

Plate XXXVIII, Figs. 1—3.

Hyla vanvlietii, Baird, Pr. A. N. Sc. VII, April, 1854, 61.

Sp. Ch.—Nearly smooth above. Tympanum nearly as large as the eye. Tibia half as long as the body, longer than arm from elbow, which in turn exceeds the foot. Ash gray or olive, with an irregular cruciform dorsal blotch. A black spot on the side above the foreleg. A white spot under the eye. Thigh and leg with three transverse bands each. Their inner surfaces (when flexed) scarcely reticulated but spotted with white upon a darker ground. Inside of tibia uncolored. Body two inches long.

Brownsville, Texas. Captain Van Vliet.

125. HYLA AFFINIS, Baird.

Plate XXXVIII, Figs. 4—7.

Hyla affinis, Baird, Pr. A. N. Sc. VII, April, 1854, 61.

Sp. Ch.—Body rough. Tympanum two-thirds the size of eye. Tibia not quite half the length of the body, but reaching more than half way from anus to centre of eyes. Color ash grey or green, with numerous rounded dorsal blotches. Three transverse bands on each thigh and leg. No vermiculation on anterior and posterior faces of hind legs, nor on lower part of sides. A light spot under the eye. Web of hand extending only to the third joint of the second finger. Arm from elbow less than tibia, but longer than hind foot. About 1½ inches long.

Northern Sonora. J. H. Clark.

126. AMBLYSTOMA PROSERPINA, B. & G.

Plate XXXV, Figs. 7—14.

Amblystoma proserpina, B. & G. Pr. A. N. Sc. VI, Oct. 1852, 173.

Salado river, Texas.

127. AMBLYSTOMA TEXANUM, Baird.

Plate XXXV, Fig. 15.

? *Salamandra texana,* Matthes, Allg. Deut. Nat. Zeitung, I, 1855, 266.

Lower Rio Grande.

128. SIREN LACERTINA, L.

Lower Rio Grande, Texas.

ALPHABETICAL INDEX.

Page.

- Acris crepitans 28
- Agama torquata 6
- Alligator lucius 5
- Amblystoma proserpina 29
  - texanum 29
- Ancistrodon contortrix 15
- Anniella pulchra 13
- Anolis carolinensis 12
- Anota mc'callii 9
- Arizona elegans 18
- Aspidonectes emoryii 3

- Bascanion flaviventris 20
- Batrachia 25
- Boa contortrix 15
- Bufo alvarius 26
  - americanus 25
  - cognatus 27
  - dorsalis 27
  - debilis 27
  - granulosus 25
  - halophila 25
  - insidior 25
  - nebulifer 25
  - punctatus 25
  - speciosus 26
  - woodhousii 27

- Callisaurus ventralis 8
- Chelonura temminckii 3
- Chelydra lacertina 3
- Chrysemys oregonensis 4
- Churchillia bellona 18
- Cnemidophorus gracilis 10
  - grahamii 10
  - gularis 11
  - guttatus 11
  - inornatus 10
  - marmoratus 10
  - octolineatus 10
  - perplexus 10
  - tigris 10
  - undulatus 10
- Coluber flaviventris 20
  - testaceus 20
- Cophosaurus texanus 8
- Copperhead 15

Page.

- Coronella balteata 20
  - sayi 20
- Crotalophorus consors 15
  - edwardsii 15
- Crotalus atrox 14
  - cerastes 14
  - confluentus 14
  - molossus 14
  - ornatus 14
  - tigris 14
- Crotaphytus collaris 6
  - dorsalis 8
  - gambelii 7
  - fasciatus 7
  - reticulatus 6
  - wislizenii 7

- Diadophis docilis 22
  - regalis 22
- Dipsas septentrionalis 16
- Dipsosaurus dorsalis 8
- Doliosaurus mc'callii 9
  - modestus 10

- Elaps tener 15
- Elgaria nobilis 11
- Emys elegans 3
  - mobilensis 3
  - oregonensis 4
- Euphryne obesa 6
- Eutaenia marciana 17
  - ornata 16
  - proxima 16

- Georgia obsoleta 20
- Gerrhonotus infernalis 11
  - nobilis 11
  - olivaceus 11
  - webbii 11
- Gopher 4
- Gypochelys lacertina 3

- Heloecetes clarkii 28
- Heloderma horridum 11
- Heterodon cognatus 17
  - nasicus 18
- Holbrookia affinis 8

Page.
Holbrookia approximans 8
  maculata 8
  propinqua 8
  texana 8
Homalosaurus ventralis 8
Hyla affinis 29
  eximia 29
  semifasciata 28
  vanvlietii 29

Kinosternon sonoriense 3

Lamprosaurus guttulatus 11
Lamprosoma episcopum 21
  occipitale 21
Leptophis majalis 21
Lygosoma laterale 13

Masticophis flavigularis 20
  ornatus 20
  schottii 20
  testaceus 20
Moccasin 15

Nerodia woodhousii 17

Ophibolus boylii 20
  sayi 20
  splendidus 20
Ophidia 14

Phrynosoma cornutum 9
  modestum 10
  orbiculare 9
  regale 9
Phyllodactylus tuberculosus 12
Pituophis affinis 18
  bellona 18
Pityophis bellona 18
Platythyra flavescens 3
Plestiodon guttulatus 12
  obsoletus 12
  tetragrammus 12
Psammophis flavigularis 20
Ptychemys mobilensis 3

Rana areolata 28
  berlandieri 27
  catesbiana 27

Page.
Rana montezumae 27
Rattlesnake 14
Regina clarkii 17
  grahamii 17
Rena dulcis 24
Rhinochilus lecontii 21
Rhinostoma occipitale 21

Salvadora grahamiae 21
Scaphiopus couchii 28
Sceloporus clarkii 5
  consobrinus 5
  couchii 6
  delicatissimus 6
  magister 6
  marmoratus 6
  ornatus 5
  poinsettii 5
  scalaris 6
  spinosus 6
  thayeri 6
  torquatus 6
Scincus lateralis 13
Scotophis emoryii 19
  lindheimeri 19
Siren lacertina 27
Soft-shelled turtle 3
Sonora semiannulata 21
Sphaeriodactylus notatus 12
Stenodactylus variegatus 12

Taeniophis imperialis 23
Tantilla gracilis 23
Tapaya hernandezii 9
  ornatissima 9
Thyrosternum sonoriense 3
Toads 25
Toluca lineata 23
Toxicophis pugnax 15
Trachemys elegans 3

Uta graciosa 7
  linearis 7
  ornata 7
  schottii 7
  stansburiana 7
  symmetrica 7

Xerobates berlandieri 4

LIST OF PLATES.

Plate I.——*Crotalus atrox*, B. & G.
Plate II.——*Crotalus molossus*, B. & G.
Plate III.——*Crotalus cerastes*, Hallow.
Plate IV.——*Crotalus tigris*, Kennicott.
Plate V.——Fig. 1.—*Crotalophorus edwardsii*, B. & G.
  Fig. 2.—*Salvadora grahamiae*, B. & G.
Plate VI.——*Toxicophis pugnax*, B. & G.
Plate VII.——Fig. 1.—*Elaps tener*, B. & G.
  Fig. 2.—*Regina grahamii*, B. & G. (young.)
Plate VIII.——Fig. 1.—*Dipsas septentrionalis*, Kenn.
  Fig. 2.—*Lamprosoma episcopum*, Kennicott.
Plate IX.——*Eutaenia ornata*, B. & G.
Plate X.——*Regina clarkii*, B. & G.
Plate XI.——Fig. 1.—*Heterodon nasicus*, B. & G.
  Fig. 2.—*Regina clarkii*, B. & G. (young.)
Plate XII.——*Scotophis emoryi*, B. & G.
Plate XIII.——*Arizona elegans*, Kennicott.
Plate XIV.——*Ophibolus splendidus*, B. & G.
Plate XV.——*Georgia obsoleta*, B. & G.
Plate XVI.——*Masticophis testaceus*, B. & G.
Plate XVII.——*Masticophis ornatus*, B. & G.
Plate XVIII.—*Masticophis schotti*, B. & G.
Plate XIX.——Fig. 1.—*Taeniophis imperialis*, B. & G.
  Fig. 2.—*Diadophis regalis*, B. & G.
  Fig. 3.—*Sonora semiannulata*, B. & G.
Plate XX.——*Rhinocheilus lecontii*, B. & G.
Plate XXI.——Fig. 1.—*Lamprosoma occipitale*, Hallow.
  Fig. 2.—*Toluca lineata*, Kennicott.
  Fig. 3.—*Diadophis docilis*, B. & G.
Plate XXII.——Skulls of serpents—
  Fig. 1.—*Salvadora grahamiae*, B. & G.
  Fig. 2.—*Dipsas septentrionalis*, Kenn.
  Fig. 3.—*Eutaenia saurita*, B. & G.
  Fig. 4.—*Eutaenia marciana*, B. & G.
  Fig. 5.—*Bascanion constrictor*, B. & G.
  Fig. 6.—*Georgia obsoleta*, B. & G.
  Fig. 7.—*Masticophis testaceus*, B. & G.

Plate XXIII, Figs. 1—8. *Phyllodactylus tuberculosus*, Wieg. No. 3208.—Fig. 1, animal; fig. 2, head from side; fig. 3, head from above; fig. 4, head from below; fig. 5, inguinal region; fig. 6, under surface of left hand; fig. 7, toe from above, showing the short claw; fig. 8, skin of back. All magnified except fig. 1. Female.

Figs. 9—18. *Stenodactylus variegatus*, Baird. Female. No. 3217.—Figs. 10, 11, 12, head from different views; fig. 13, inguinal region; fig. 14, a hind toe; and fig. 16, a finger from below, (not quite accurately represented;) fig. 15, hand from below; fig. 17, skin of back; and 18, skin of belly. All magnified except fig. 9.

Figs. 19—27. *Stenodactylus variegatus*, Baird. Male. No. 3213—References as above; figure of skin of belly wanting. The under surfaces of the toes and fingers, figs. 24, 26, not quite accurate. All magnified except fig. 19.

Plate XXIV, Figs. 1—10. *Gerrhonotus webbii*, Baird. Young.—Fig. 1, animal; figs. 2, 3, 4, views of head; fig. 5, upper surface of left hand. fig. 6, tip of a finger, highly magnified; fig. 7, upper surface of left hind foot; fig. 8. portion of belly; fig. 9, portion of the side, showing the lateral fold. All magnified except fig. 1.

Figs. 11—19. *Stenodactylus variegatus*, Baird. Young.—Fig. 11, animal; figs. 12, 13, 14, views of head; fig. 15, left hand from above; fig. 16, tip of finger; fig. 17, left hind foot from above; fig. 18, portion of back; fig. 19, portion of belly. All magnified except fig. 11.

Figs. 20—28. *Plestiodon guttulatus*, Hallowell. Young.—Fig. 20, animal; figs. 21, 22, 23, views of head; fig. 24, left hand from above; fig. 25, left foot from above; fig. 26, its longest toe, much magnified; fig. 27, scales of back; and fig. 28, of belly. Fig. 20, natural size of specimen; the others magnified.

Figs. 29—37. *Sphaeriodactylus notatus*, Baird.—Fig. 29, animal; figs. 30, 31, 32, views of the head; fig. 33, left hand from above; fig. 34, a digit from below; fig. 35, left foot from above; fig. 36, scales of back; fig. 37, scales of belly. Fig. 29, natural size; the others magnified.

Plate XXV, Figs. 1—8. *Gerrhonotus nobilis*, Baird.—Fig. 1, animal; fig. 2, head from above; fig. 3, eyelids; fig. 4, head and arm from below; fig. 5, anal region; fig. 6, scales of back; fig. 7, scales of side; fig. 8, scales of belly. Figs. 3, 6, 7, and 8, magnified.

Figs. 9—16. *Plestiodon obsoletus*, B. & G.—Fig. 9, animal; fig. 10, head from above; fig. 11, eyelids; fig. 12, (right hand side,) head from below; fig. 12, (left hand side,) arm from below; fig. 14, inguinal region and hind leg from below; fig. 15, scales of back; fig. 16, scales of belly. Figs. 11, 15, 16, magnified.

Plate XXVI, Figs. 1—10. *Heloderma horridum*, Wiegm. No. 2791.—Fig. 1, animal; fig. 2, head from below; fig. 3, auditory aperture; fig. 4, anal region; fig. 5, fore finger from the side; fig. 6, fore finger from below; fig. 7, hind toe from the side; fig. 8, hind toe from below; fig. 9, skin of back; fig. 10, skin of belly.

Plate XXVII, Figs. 1—12. *Euphryne obesus*, Baird.—Fig. 1, animal; fig. 2, head from above; fig. 3, head from below; fig. 4, anal region; fig. 5, fore finger from below; fig. 6, fore finger from the side; fig. 7, hind toe from below; fig. 8, hind toe from the side.

Plate XXVIII.—Figs. 1—3. *Phrynosoma regale*, Girard.

Figs. 4—6. *Doliosaurus m'callii*, Girard.

Plate XXIX.—Figs. 1—3. *Sceloporus poinsettii*, B. & G.

Figs. 4—6. *? Sceloporus spinosus*, Wiegm.

Plate XXX.—Figs. 1—2. *Holbrookia texana*, B. & G. Male.

Figs. 3—7. *Holbrookia texana*, B. & G. Female.—Fig. 3, animal; fig. 4, head from above; fig. 5, palpebral region; fig. 6, inferior surface of body; fig. 7, dorsal scales, much magnified.

Plate XXXI, Figs. 1—8. *Crotaphylus wislizenii*, B. & G. No. 2685.—Fig. 1, animal; fig. 2, head from above; fig. 3, head from the side; fig. 4, inferior surface of body; fig. 5, a fore finger from the side; fig. 6, a hind toe from the side; fig. 7, dorsal scales; fig. 8, a femoral pore. All magnified, except figs. 1 and 4.

Plate XXXII, Figs. 1—6. *Cnemidophorus grahamii*, B. & G. No. 3046*b*.—Fig. 1, animal; fig. 2, head from above; fig. 3, palpebral region; fig. 4, under surface of body; fig. 5, scales of back; fig. 6, femoral pore; figs. 3, 5, and 6 magnified.

Figs. 7—13. *Dipsosaurus dorsalis*, Hallow. No. 2699.—Fig. 7, animal; fig. 8, side of head; fig. 9, head from above; fig. 10, head from beneath; fig. 11, anal region, under surface of hind leg; fig. 12, side view of a fore finger; fig. 13, side view of a hind toe. All magnified except fig. 1.

Plate XXXIII, Figs. 1—8. *Cnemidophorus tigris*, B. & G. No. 3061. California.—Fig. 1, animal; fig. 2, head from above; fig. 3, head from the side; fig. 4, under surface of body; fig. 5, side view of a fore finger; fig. 6, side view of a hind toe; fig. 7, scales of side; fig. 8, a femoral pore. All magnified, except fig. 1.

N. B. The division of the loral plate into two, as seen in fig. 3, is unusual, the narrow linear one superposed on the larger being almost peculiar to the specimen figured.

Plate XXXIV, Figs. 1—6. *Cnemidophorus gularis*, B. & G.—References as in preceding cases, fig. 3 being the palpebral region, and fig. 6 the scales of sides and belly.

Figs. 7—14. *Cnemidophorus gracilis*, B. & G. No. 3034.

Plate XXXV, Figs. 1—6. *Scaphiopus couchii*, Baird. Adult.

Figs. 7—14. *Amblystoma proserpina*, B. & G.—Fig. 7, animal; figs. 8, 9, 10, views of head; fig. 11, open mouth, showing the tongue; fig. 12, roof of mouth magnified; fig. 13, palm of hand; fig. 14, sole of foot.

Fig. 15. *Amblystoma texana*, Baird.

Plate XXXVI, Figs. 1—4. *Rana montezumae*, Baird. Adult.

Figs. 5, 6. *Rana montezumae*, Baird. Young.

Figs. 7—10. *Rana berlandieri*, Baird.

Figs. 11, 12. *Rana areolata*, B. & G.

Plate XXXVII, Figs. 1—3. *Batrachyla longipes*, Baird. Mexico.

Figs. 4—9. *Heloecetes clarkii*, Baird.

Figs. 10—13. *Hylarana fusca*, Baird.

Figs. 14—17. *Acris acheta*, Baird.

Plate XXXVIII, Figs. 1—3. *Hyla vanvlietii*, Baird.

Figs. 4—7. *Hyla affinis*, Baird.

Figs. 8—10. *Hyla eximia*, Baird.

Figs. 11—13. *Hyla vociferans*, Baird.

Plate XXXIX, Figs. 1—4. *Bufo americanus*, Lec.

Figs. 5—9. *Bufo punctatus*, B. & G.

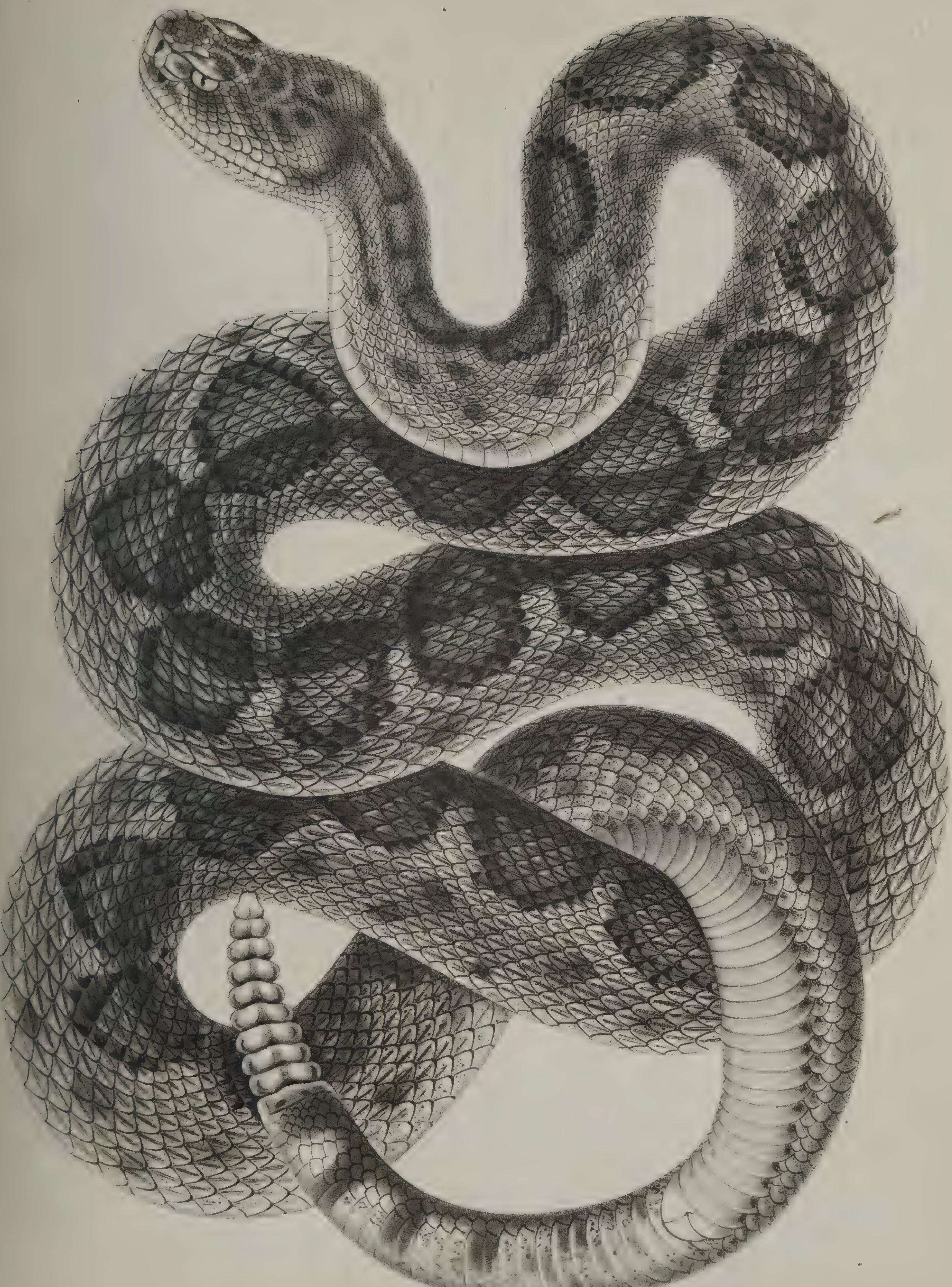
Plate XL, Figs. 1—4. *Bufo nebulifer*, Girard.

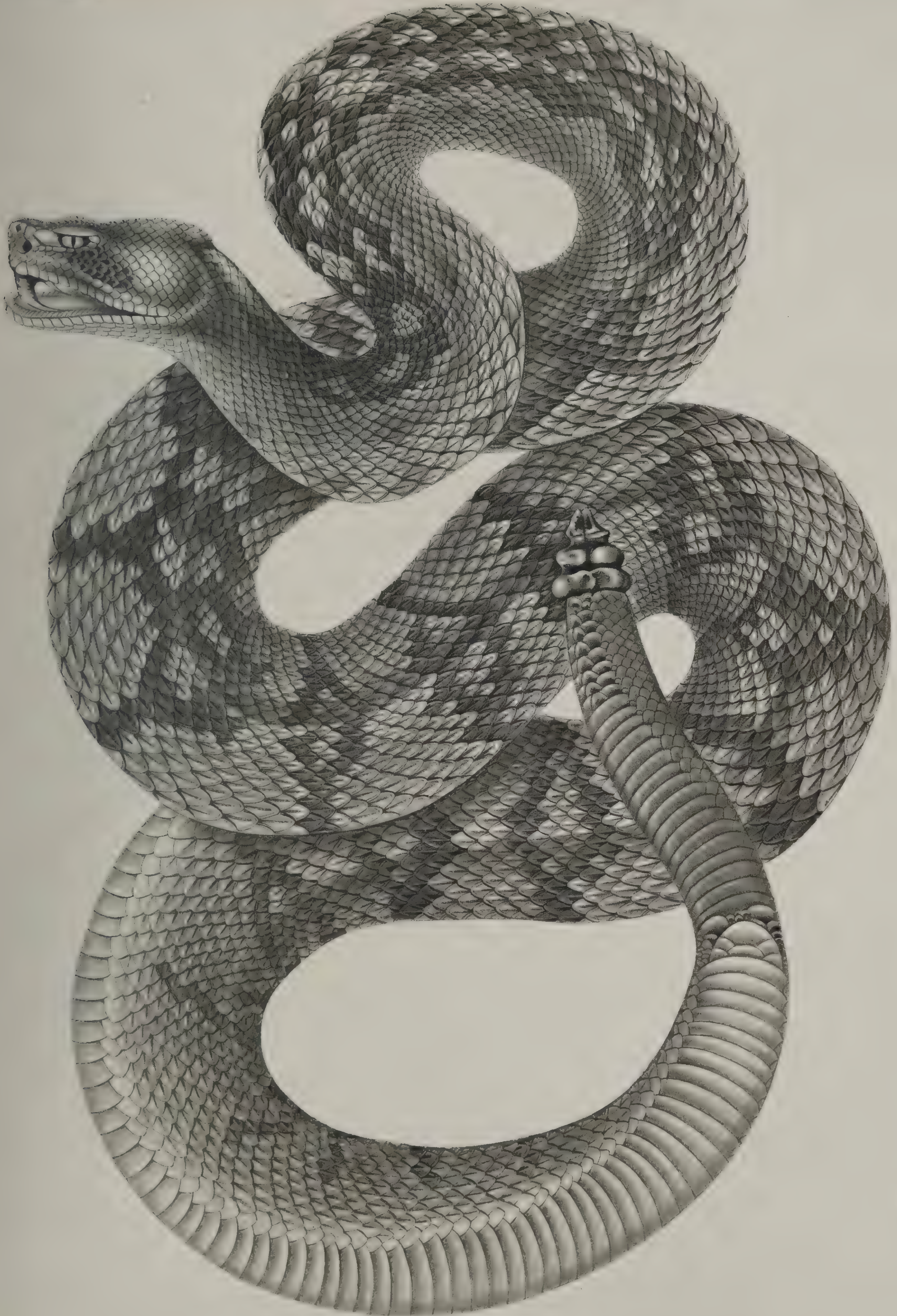
Figs. 5—11. *Bufo speciosus*, Girard.

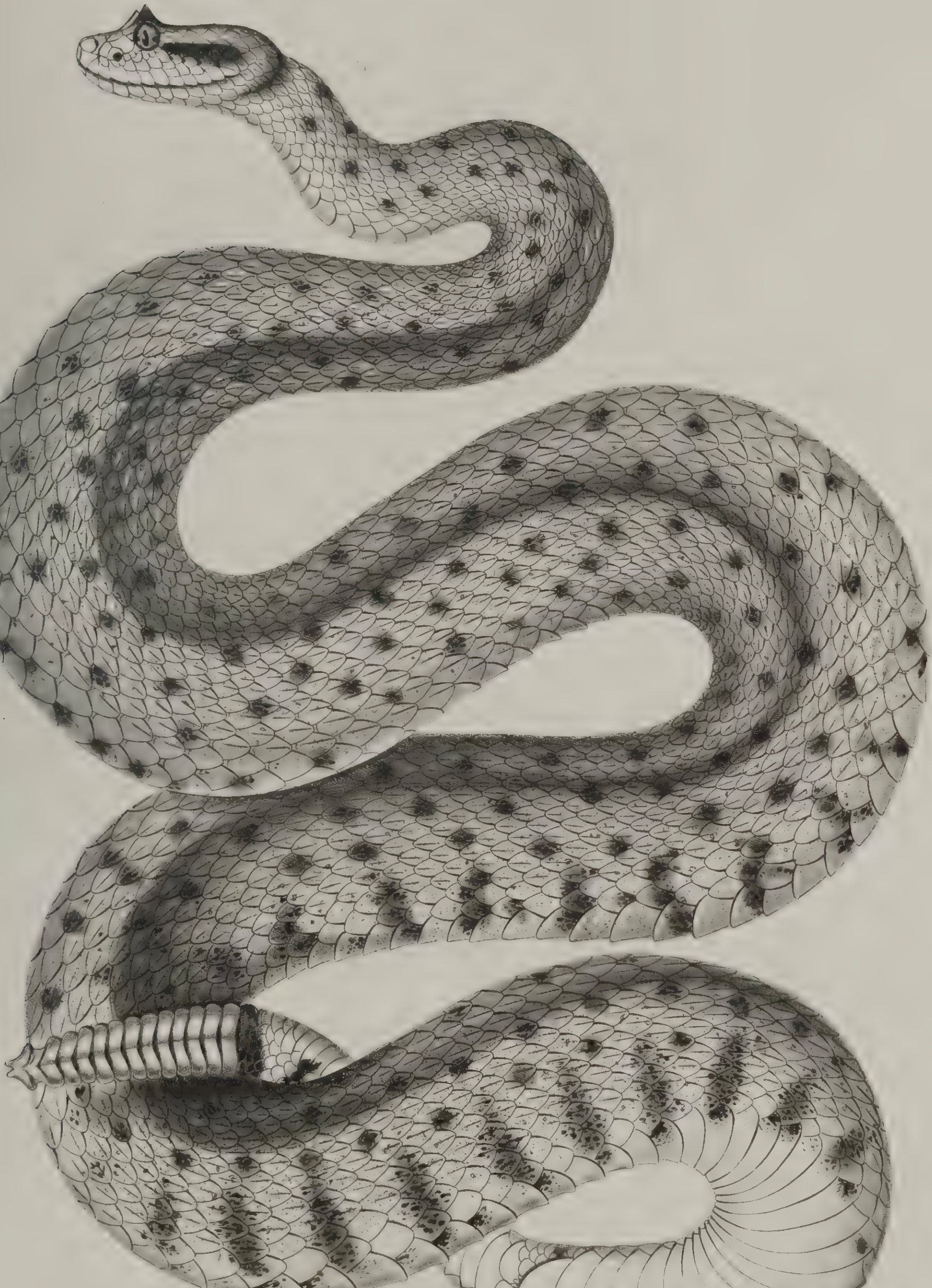
Plate XLI, Figs. 1—6. *Bufo alvarius*, Girard.

Figs. 7—12. *Bufo halophila*, B. & G.

Figs. 13—18. *Bufo insidior*, Girard.

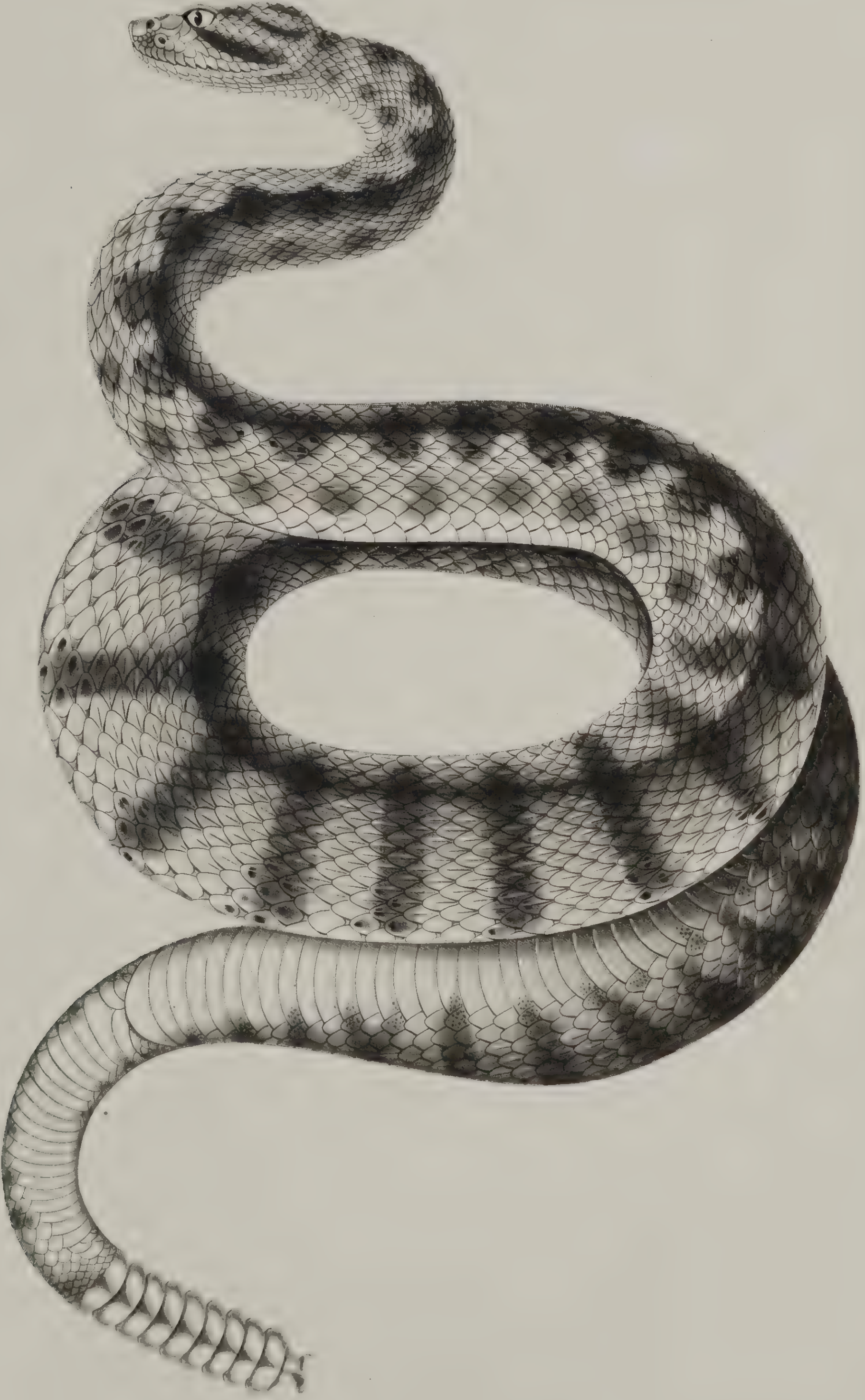






J H Richard del

W.H Dougal sc



J. H. Richard del.

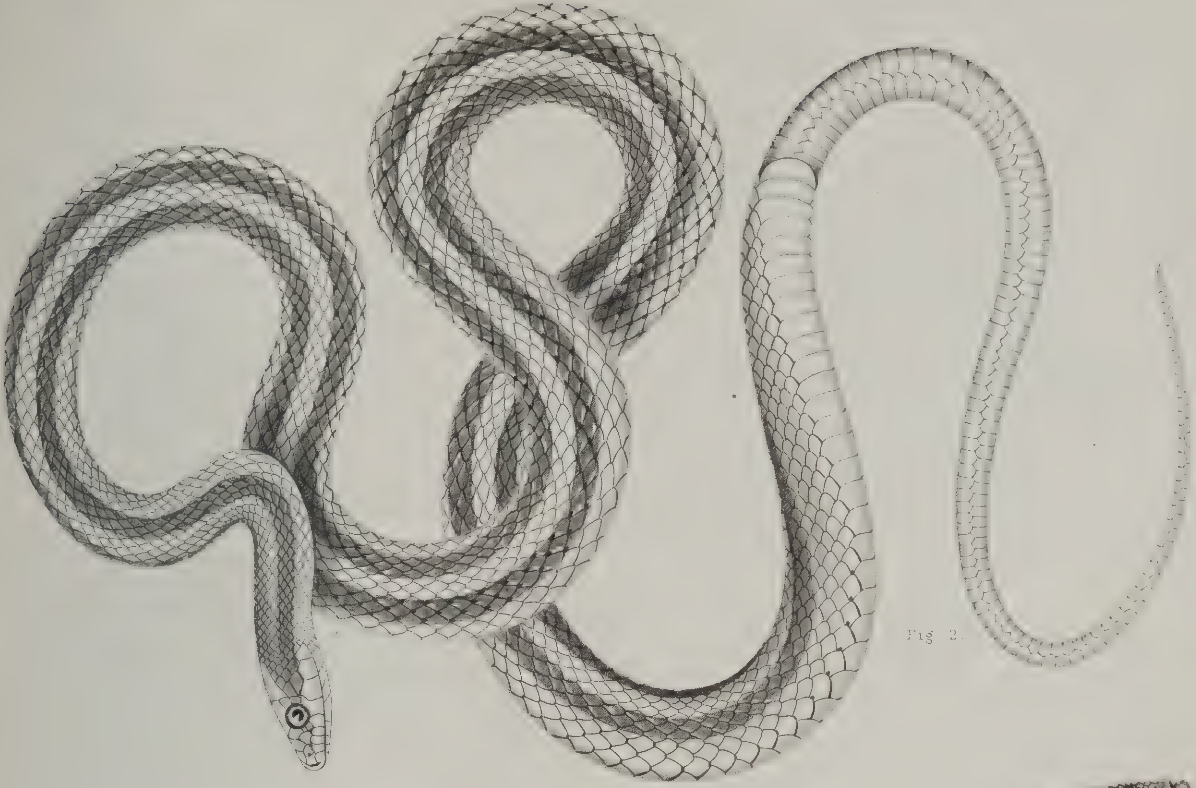


Fig. 2.

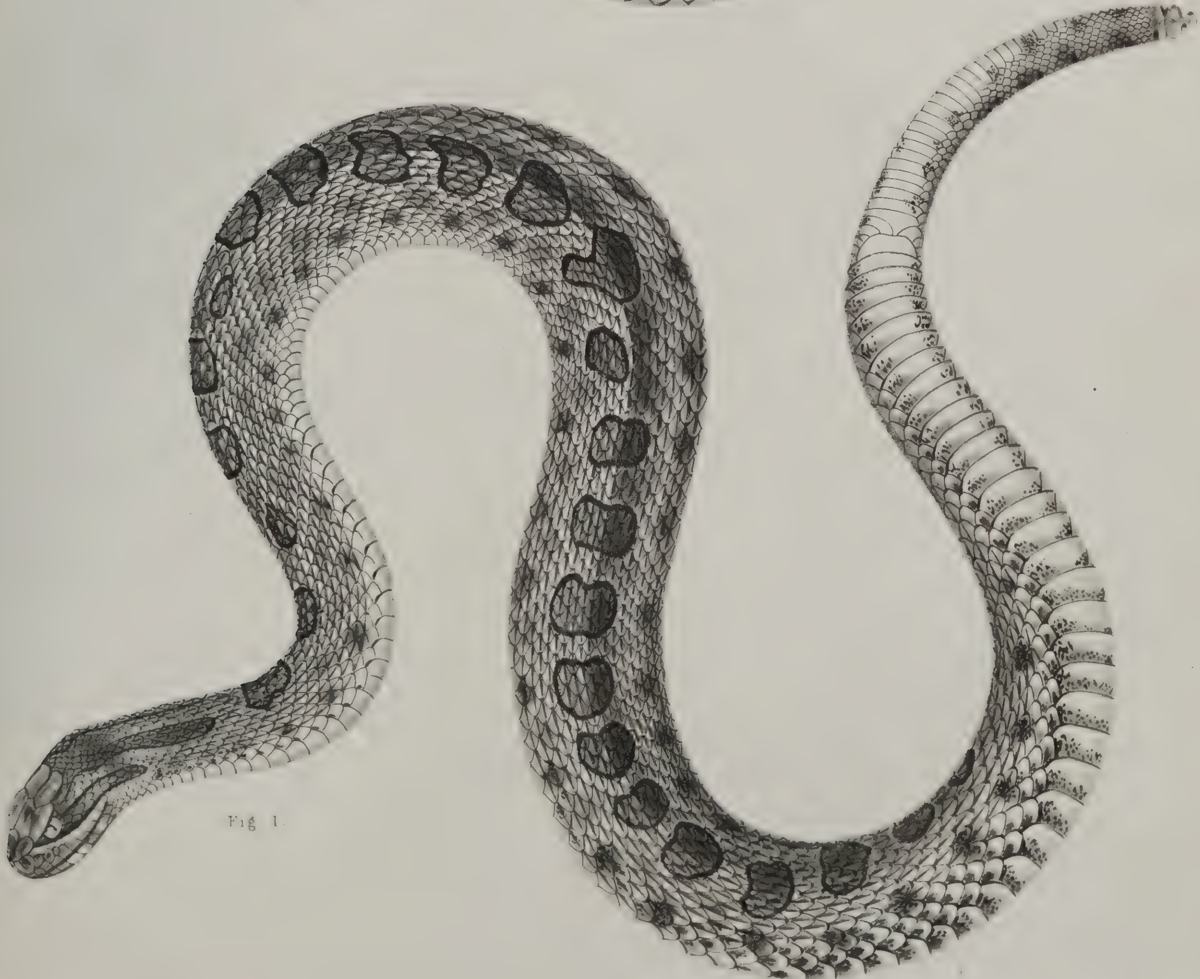


Fig. 1.

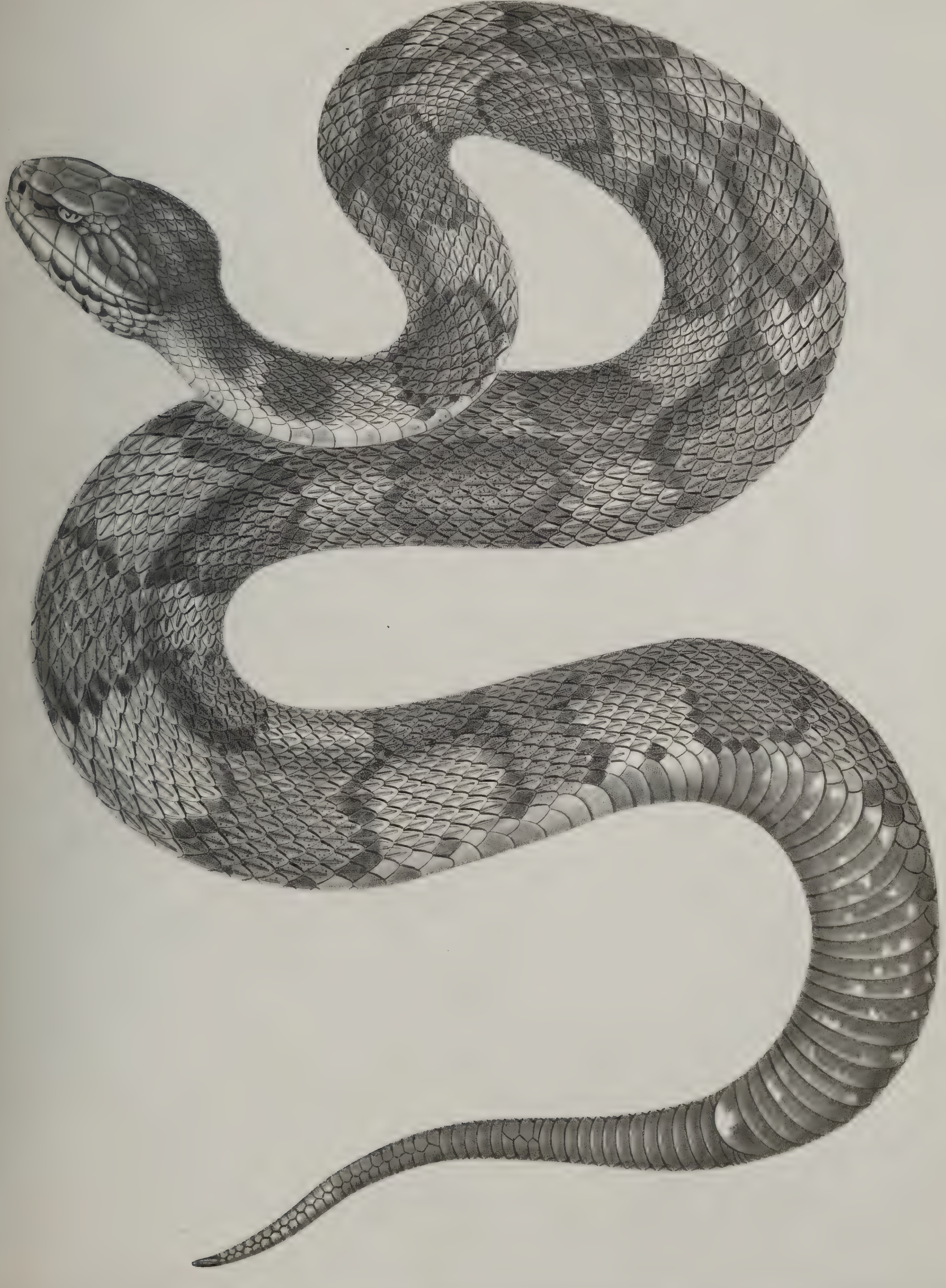


Fig. 1

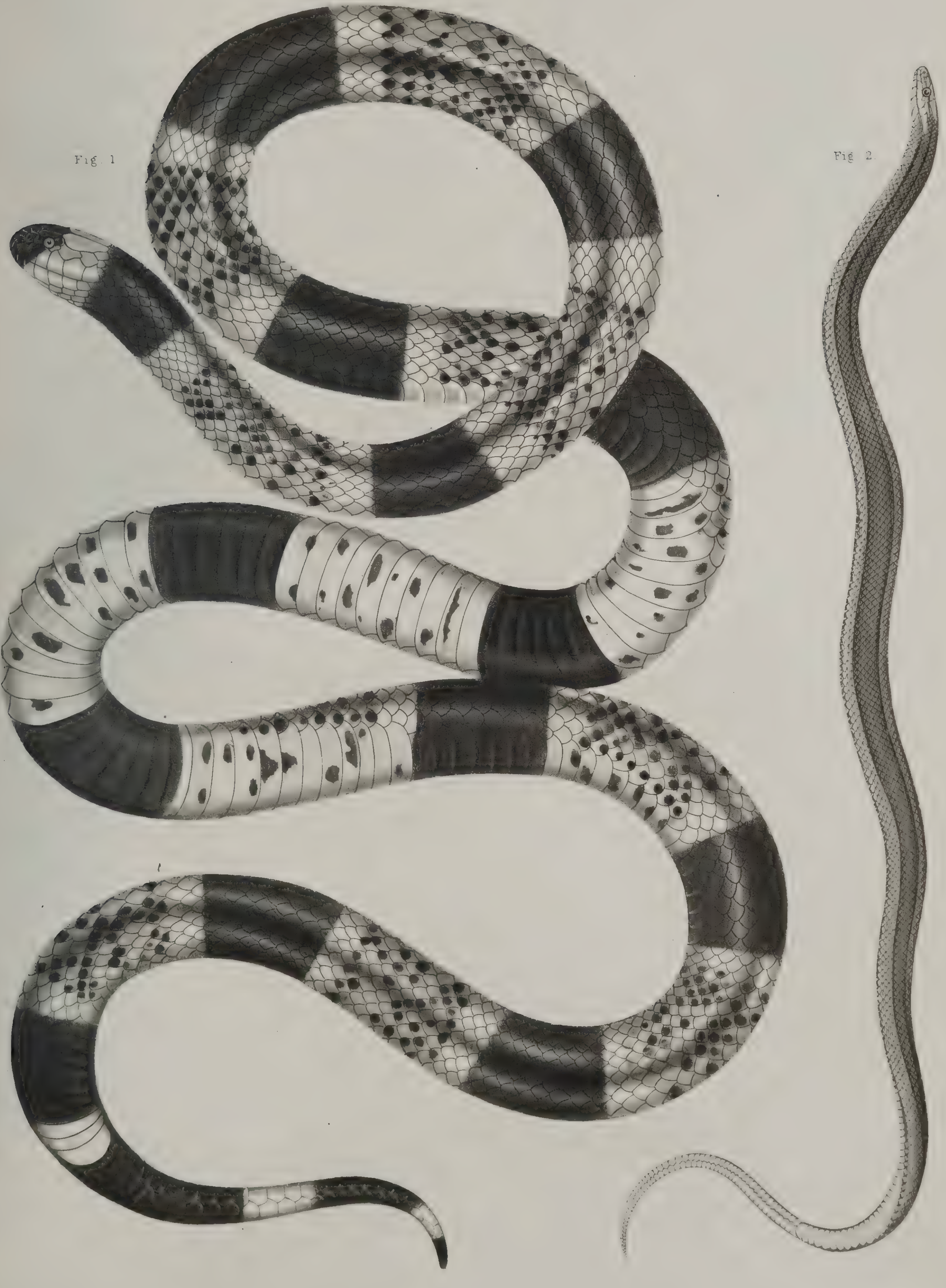
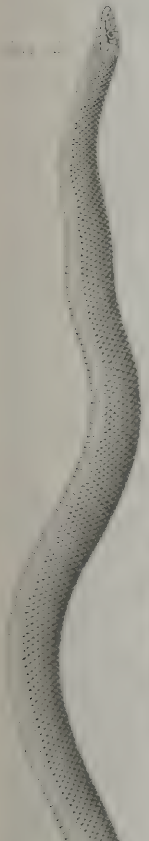


Fig. 2



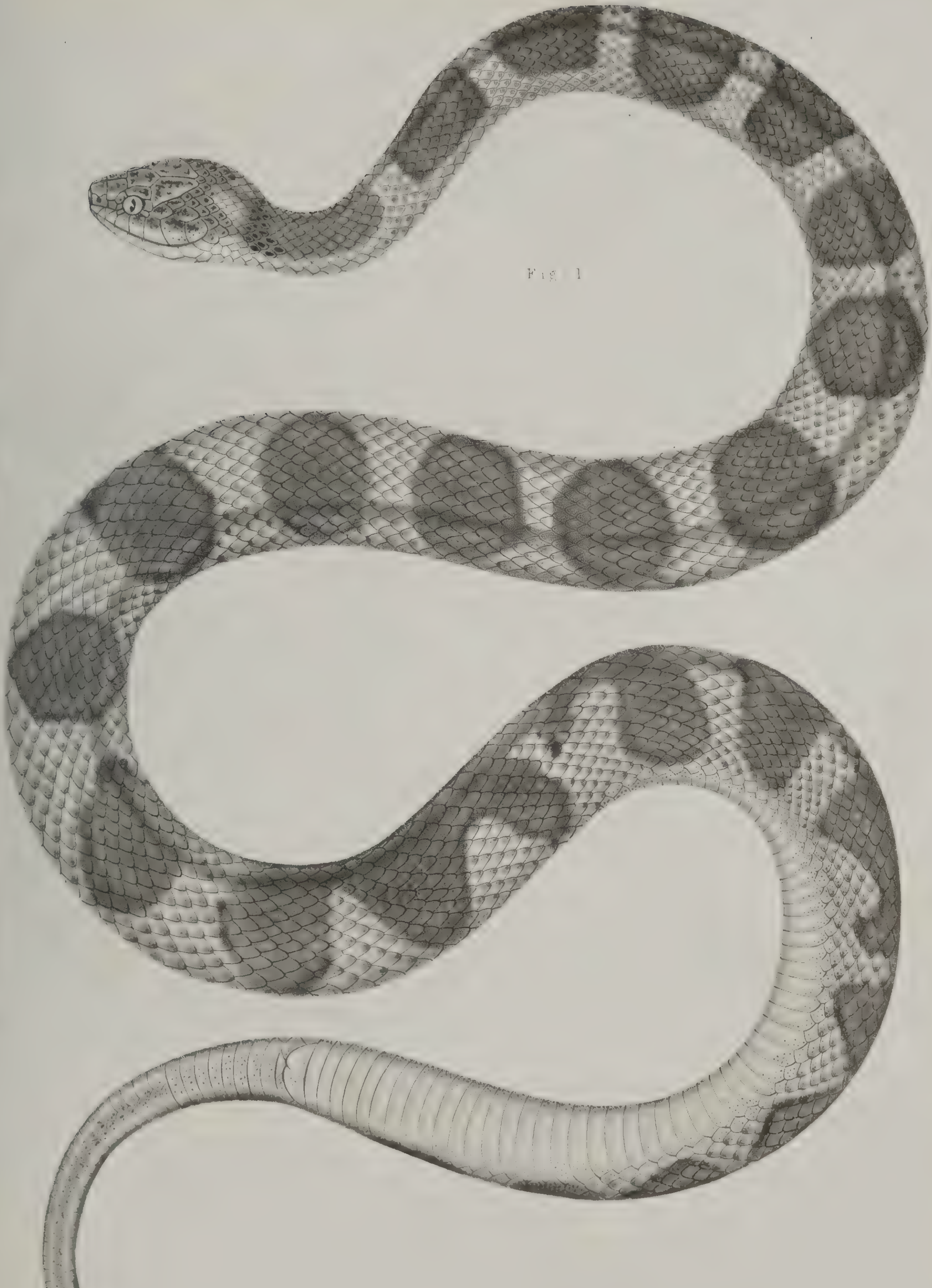
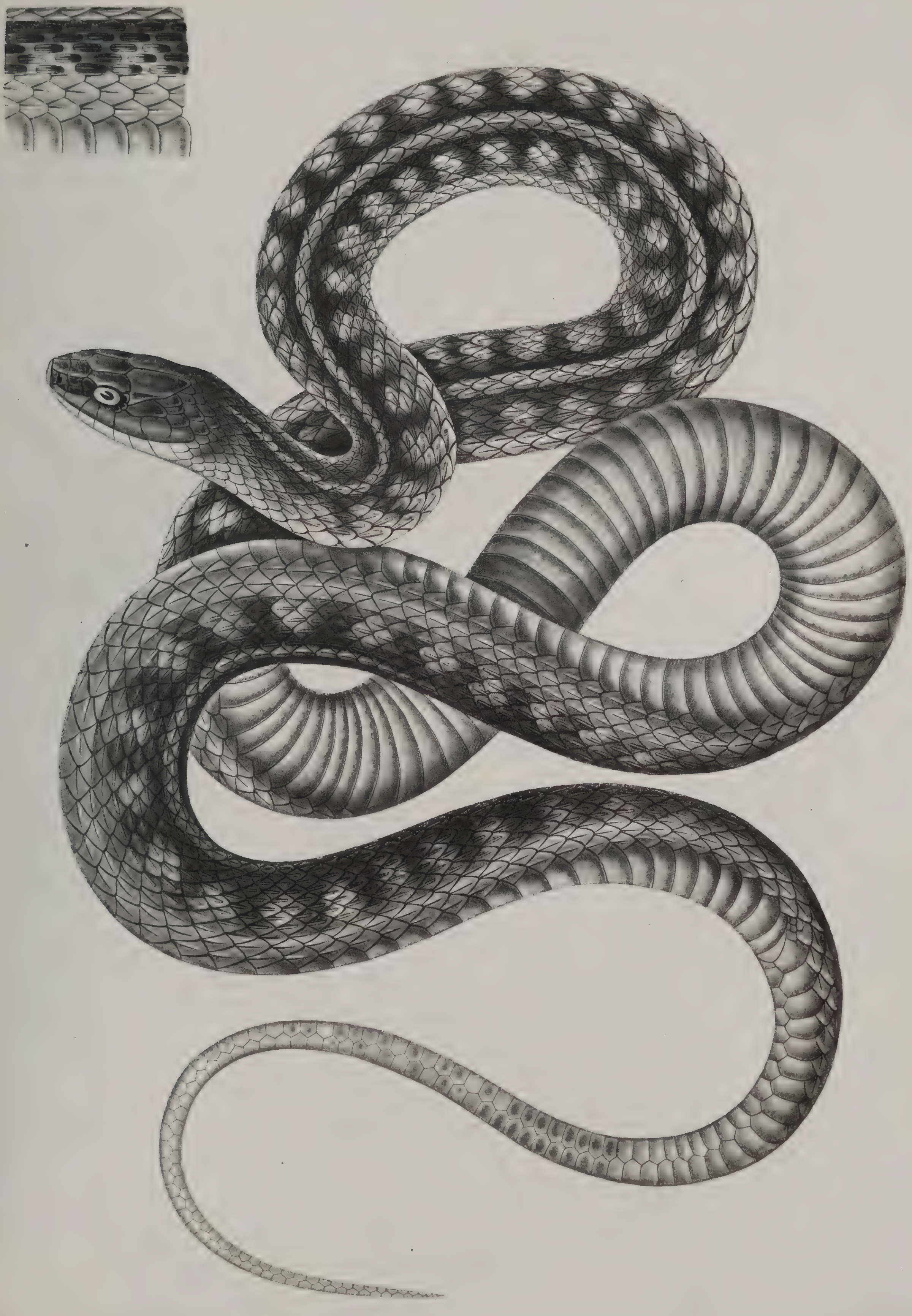
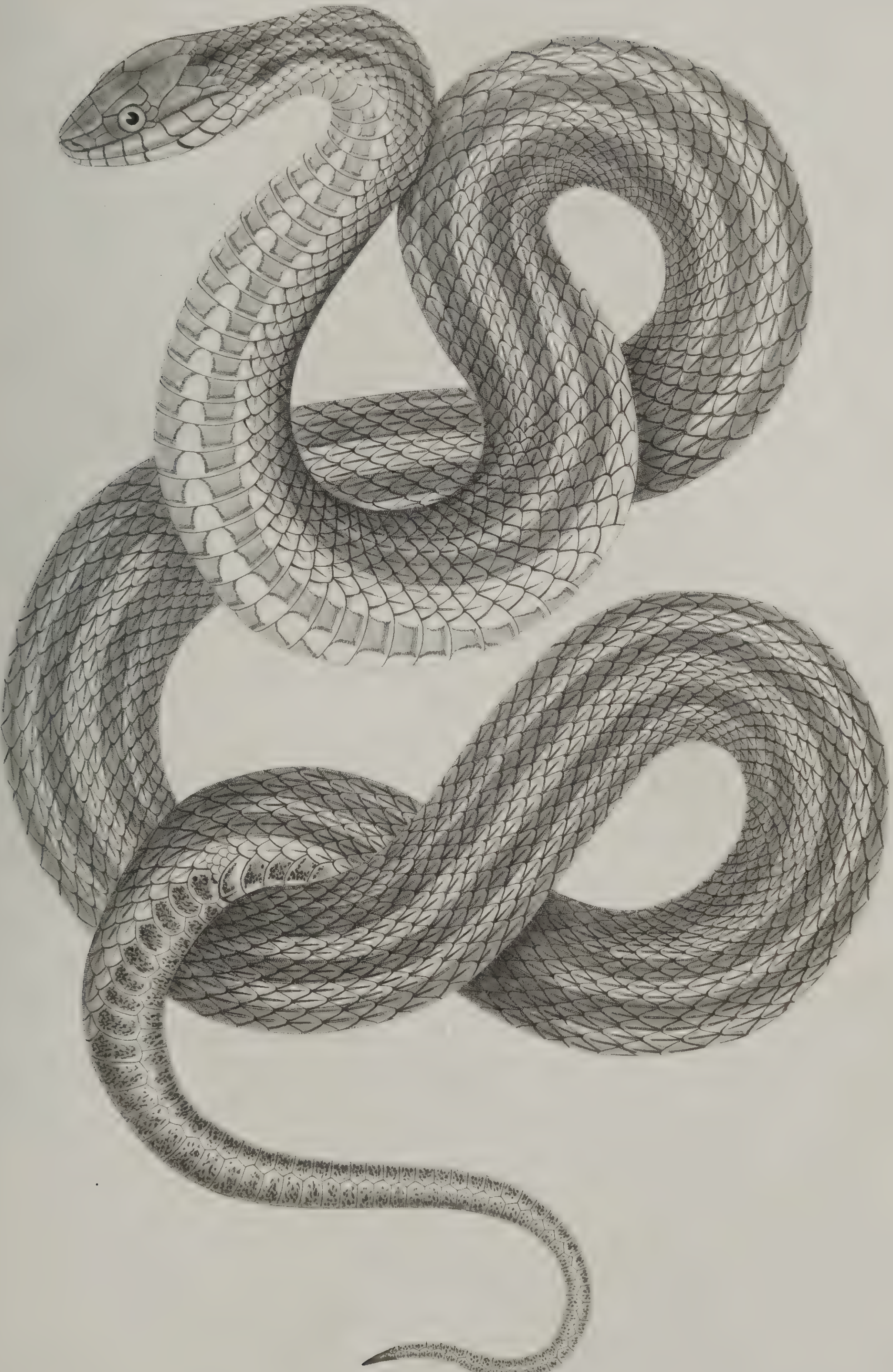
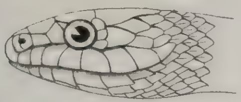


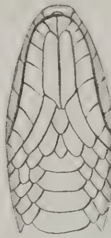
Fig. 1







2 a



2 b

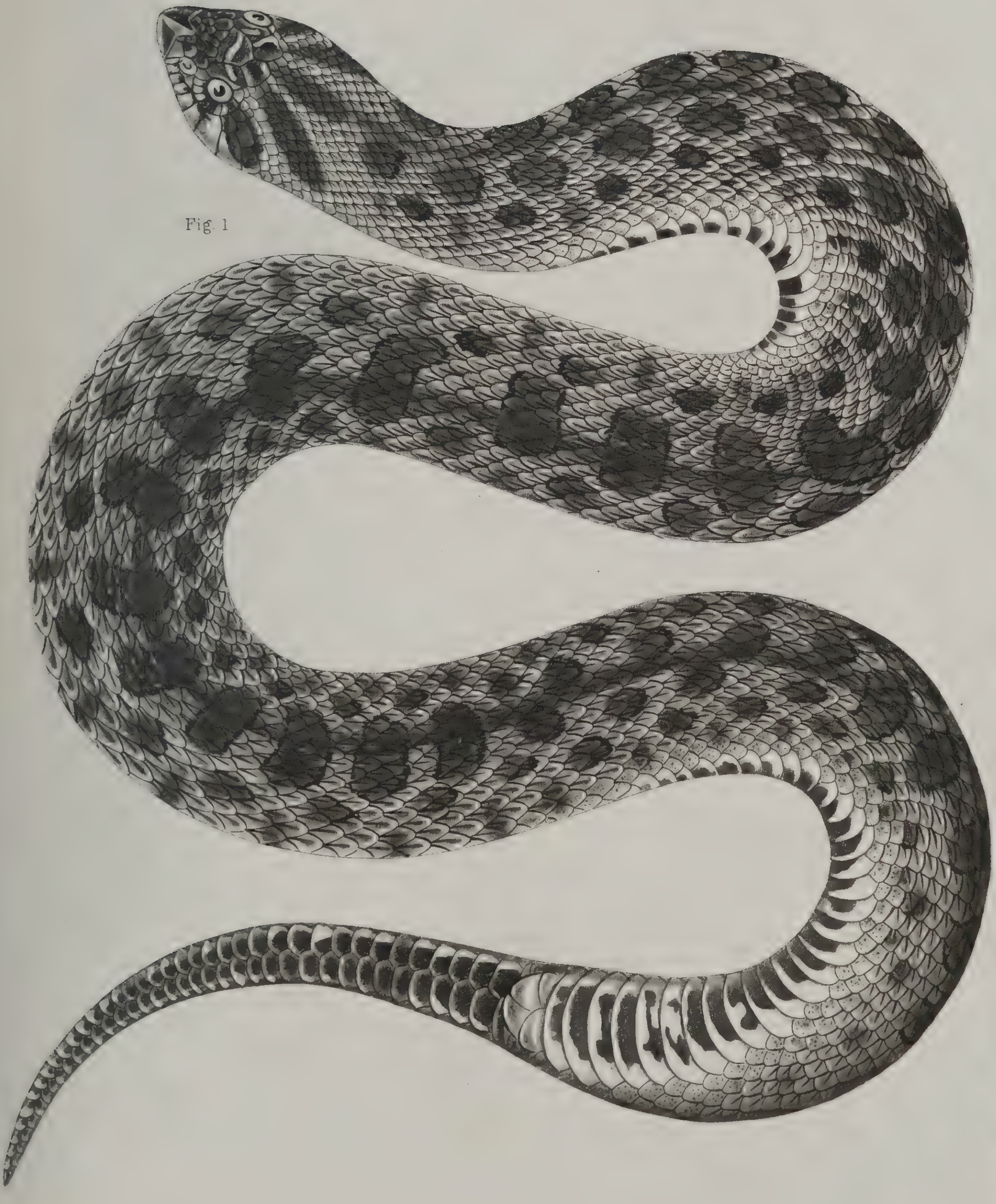


Fig. 1

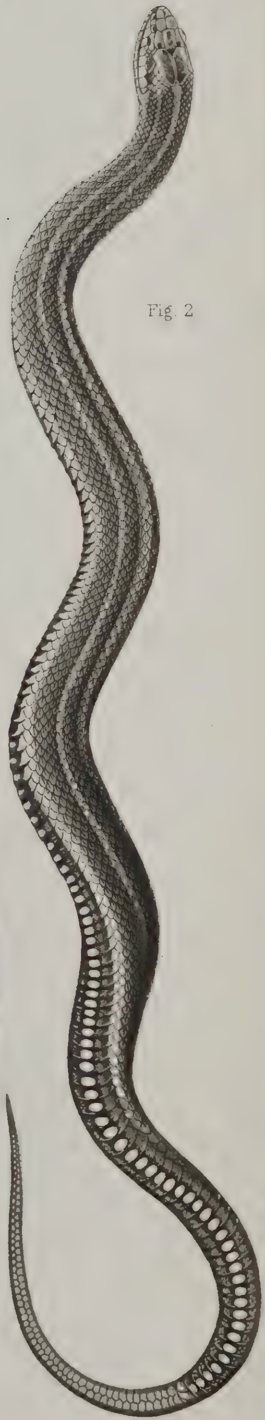
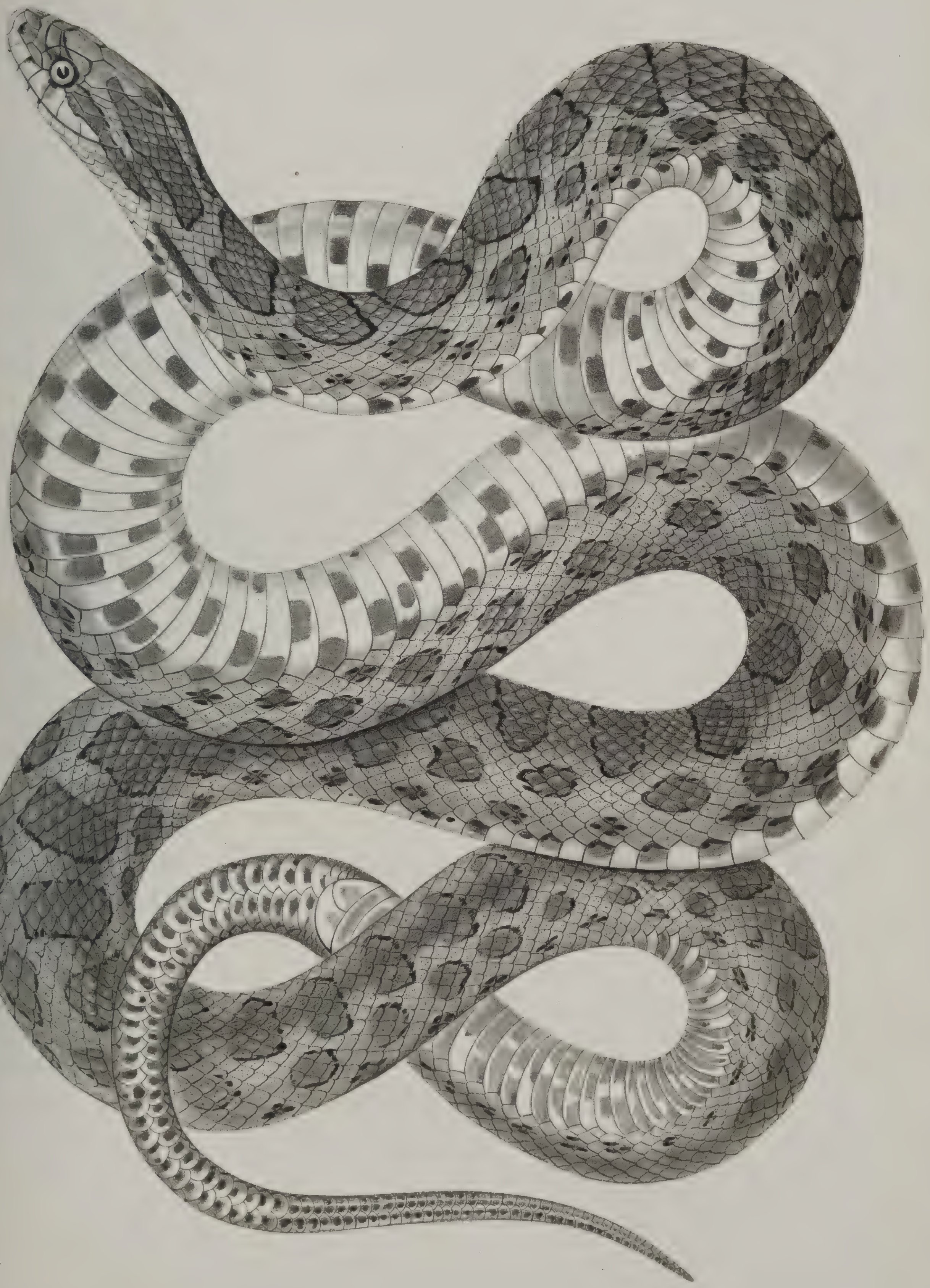
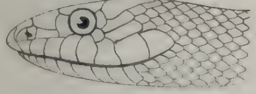


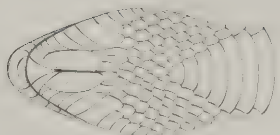
Fig. 2

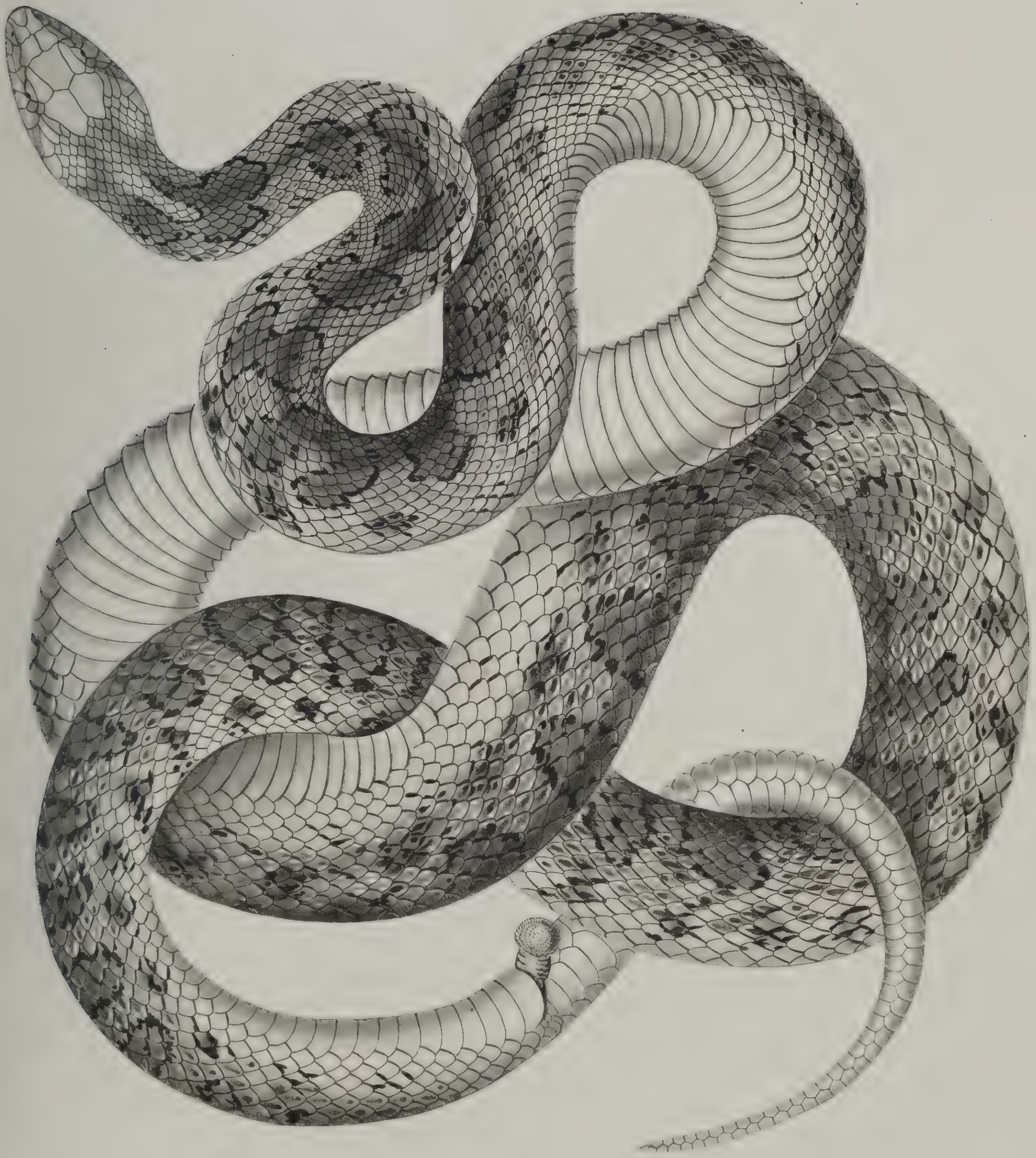
J H Richard del

W H Dougal sc

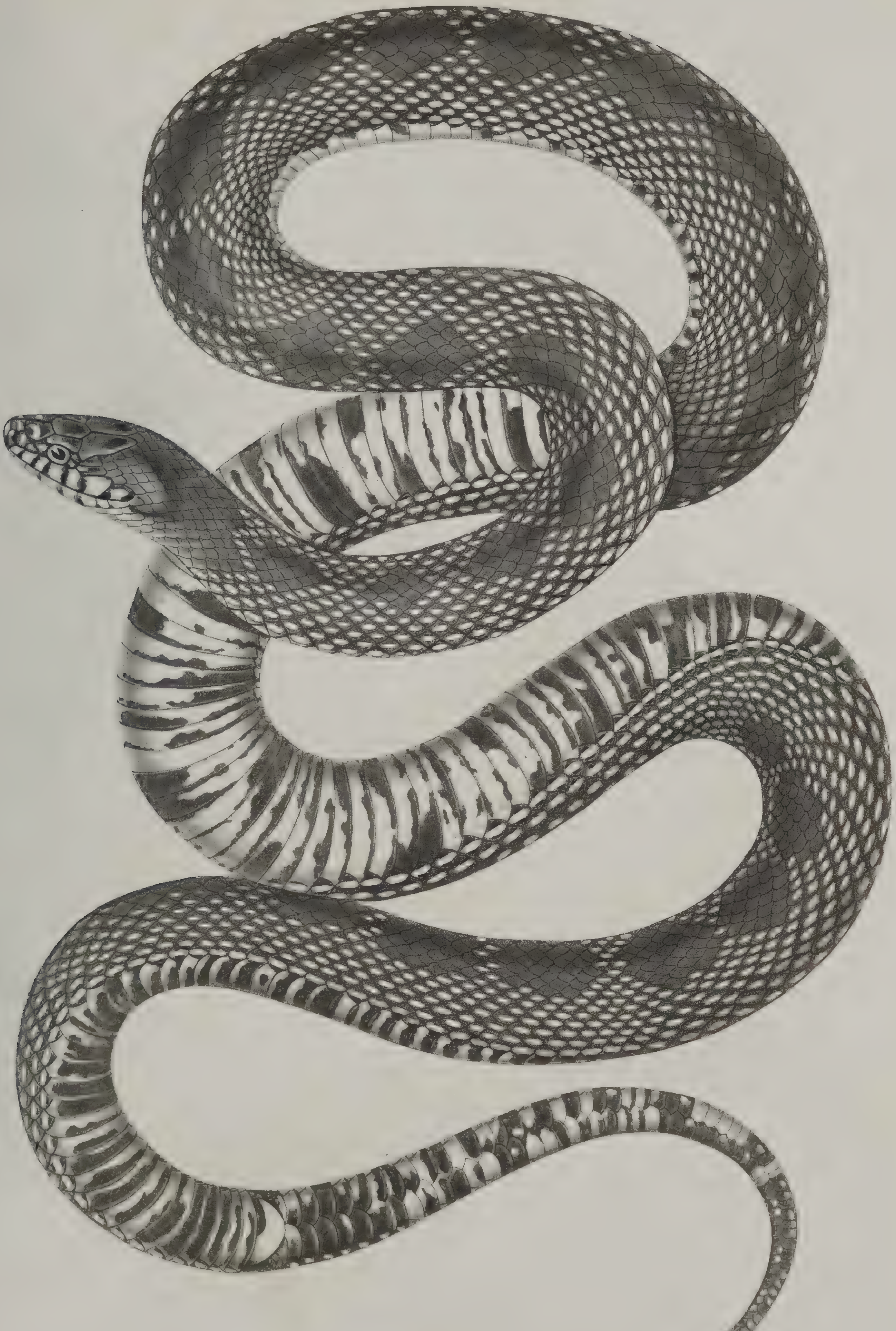


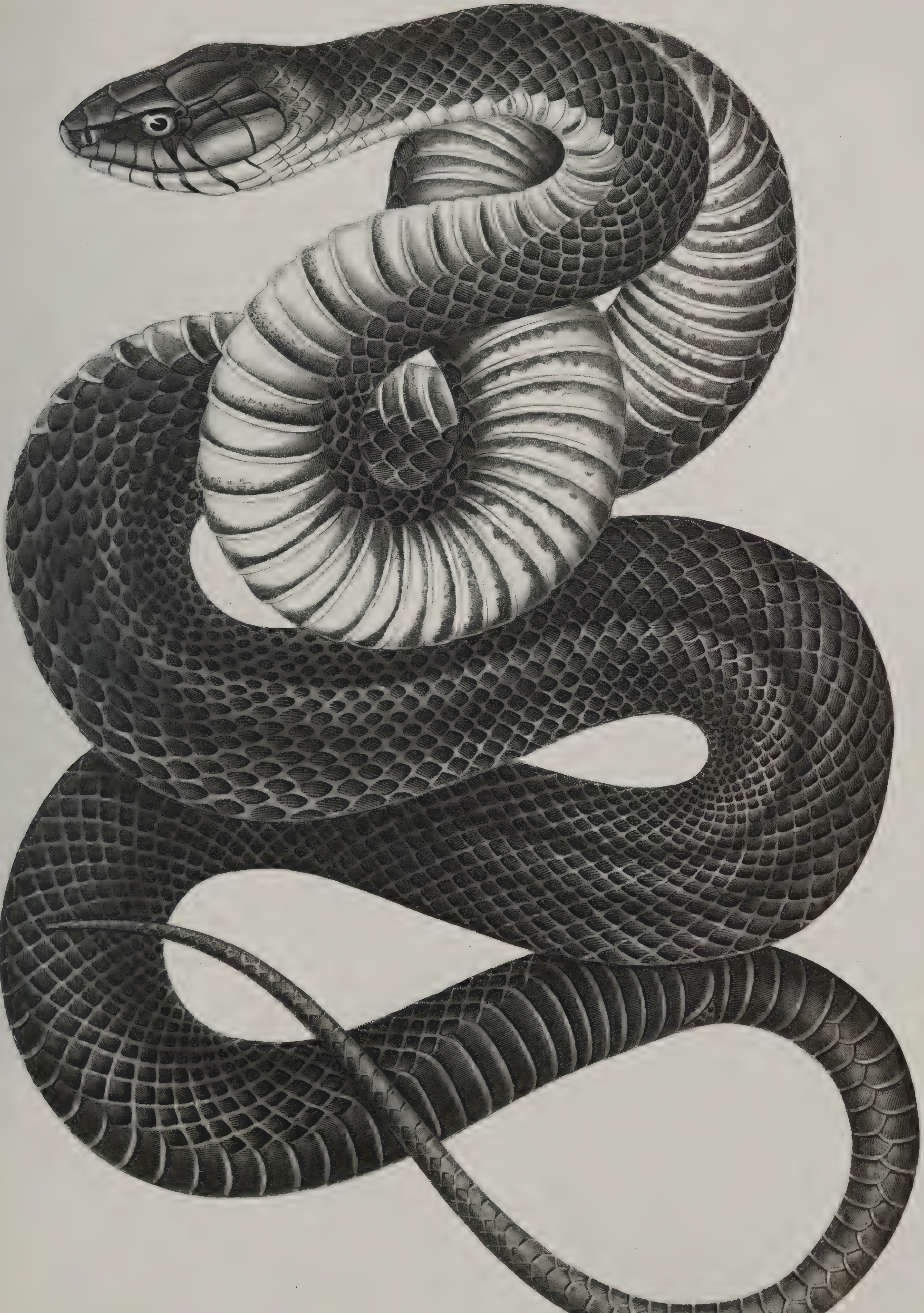


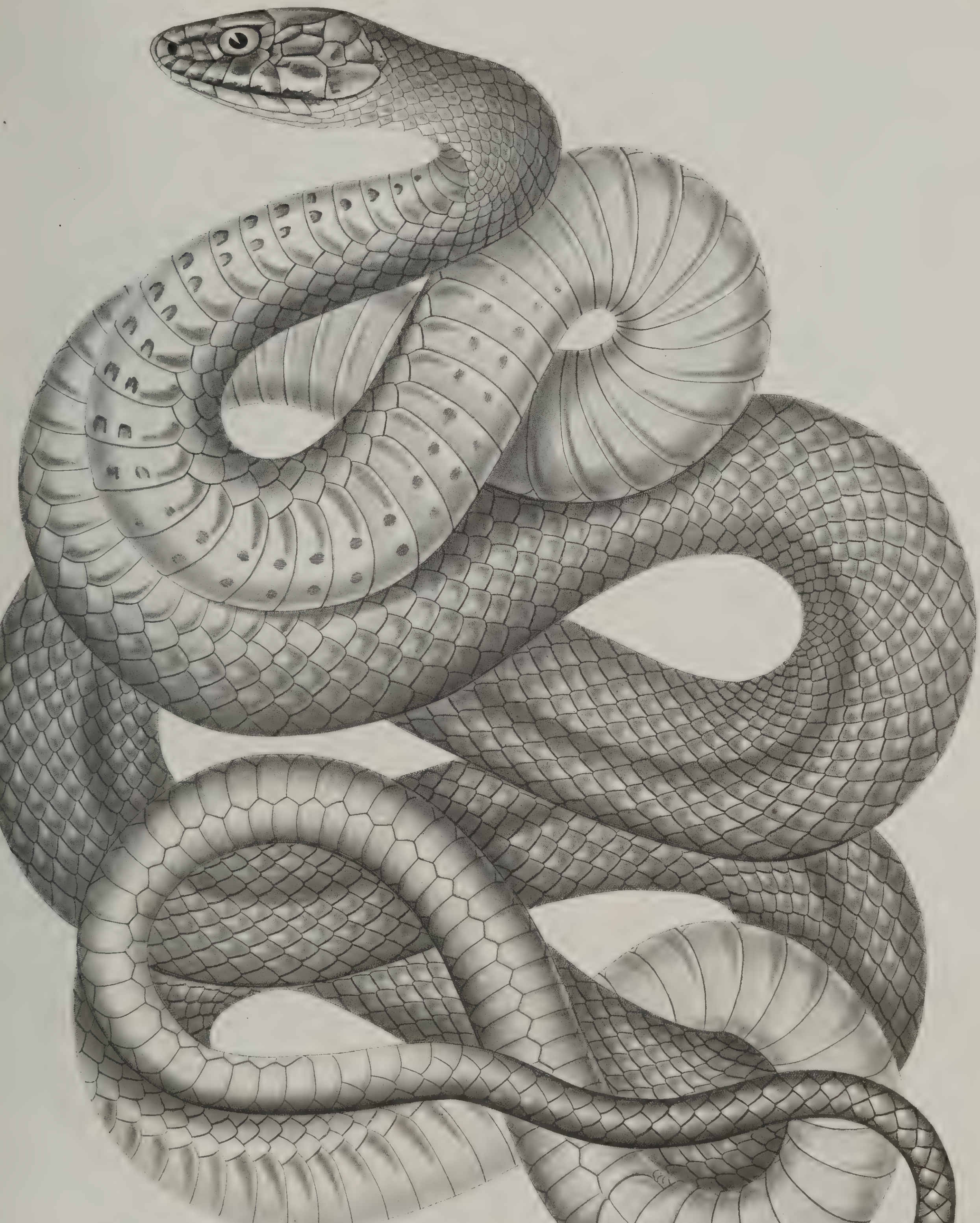


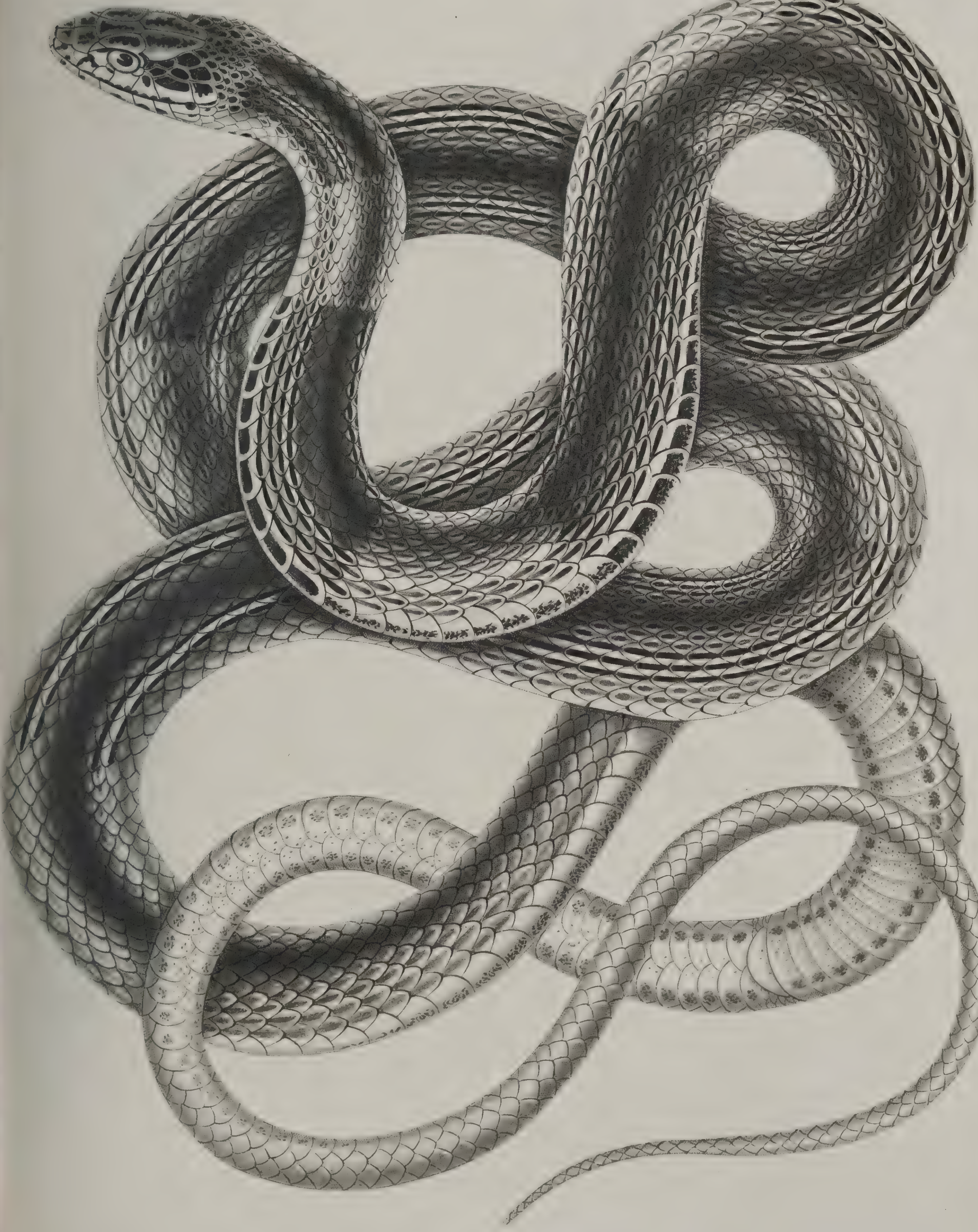


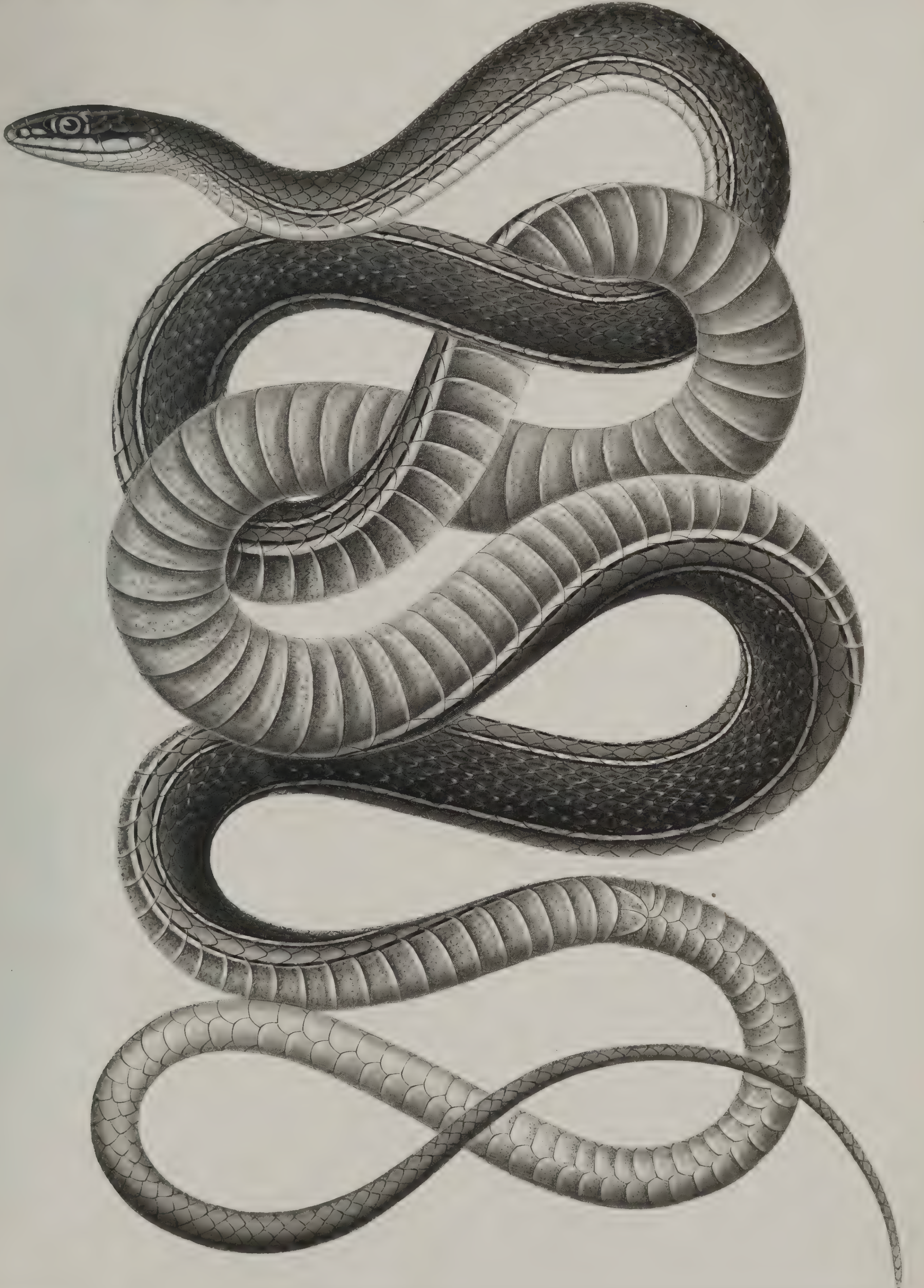
J. H. Richard del. [illegible]











J. H. Richard fec.

[illegible] sc.

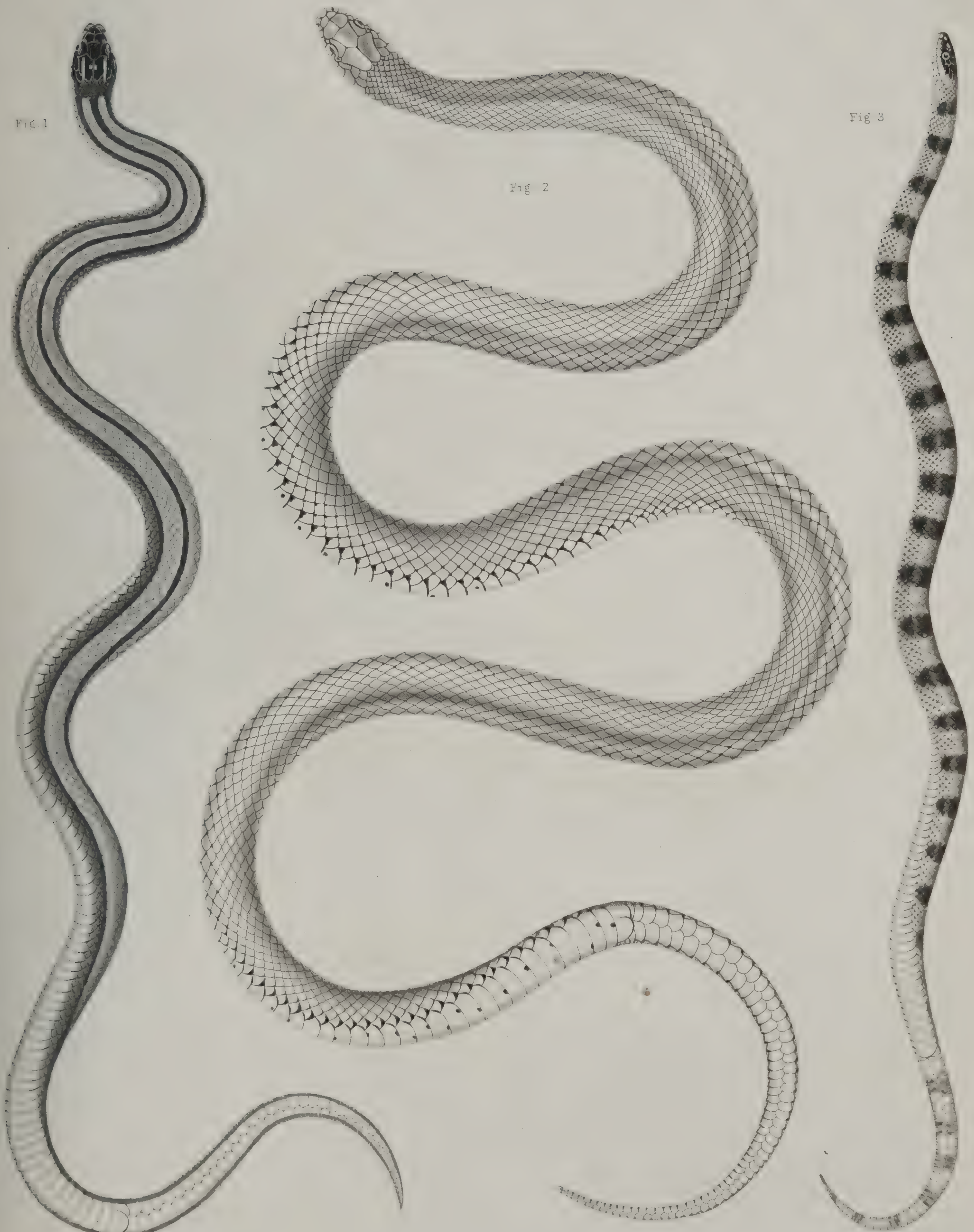


Fig. 1

Fig. 2

Fig. 3

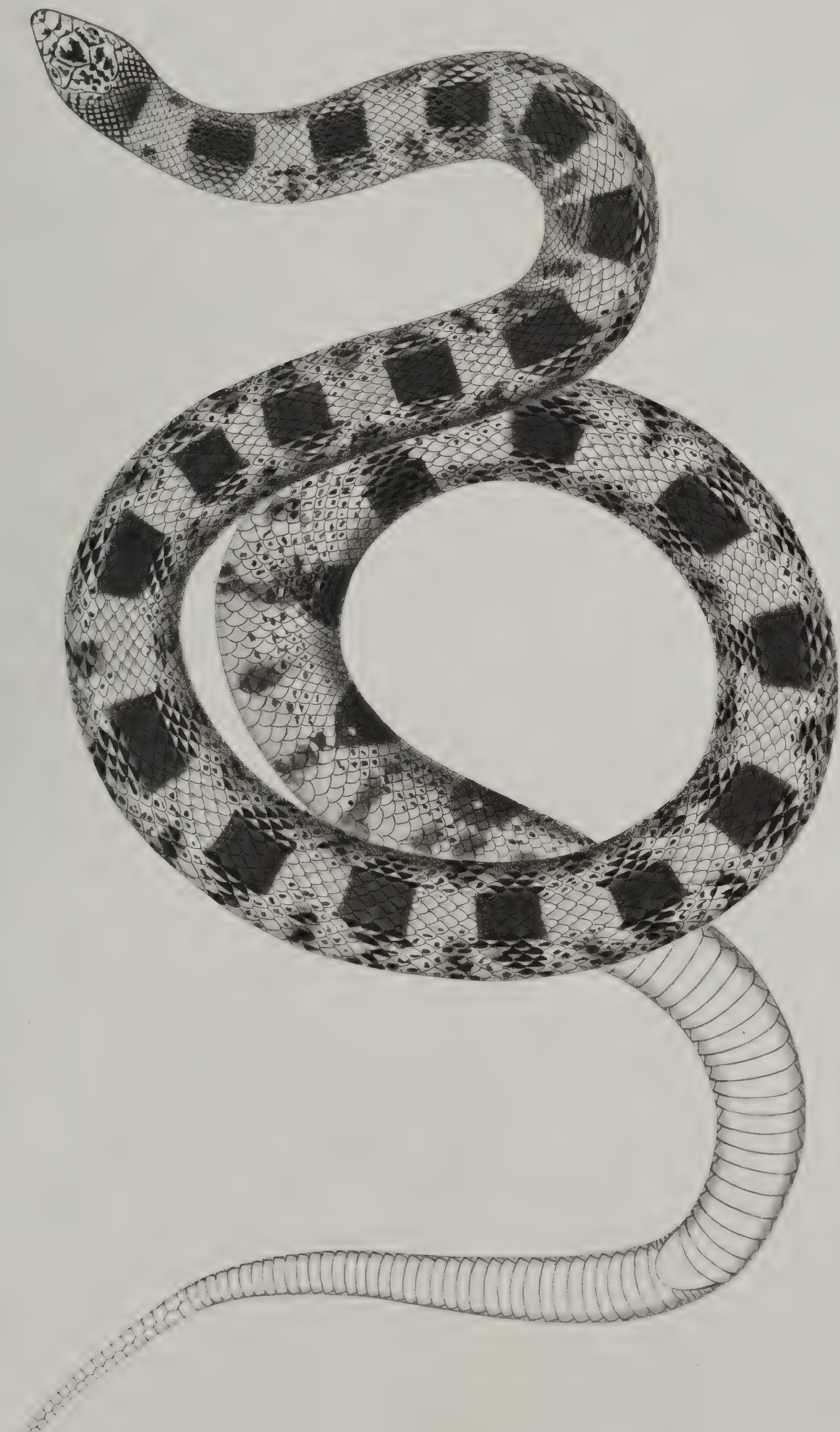


Fig 1

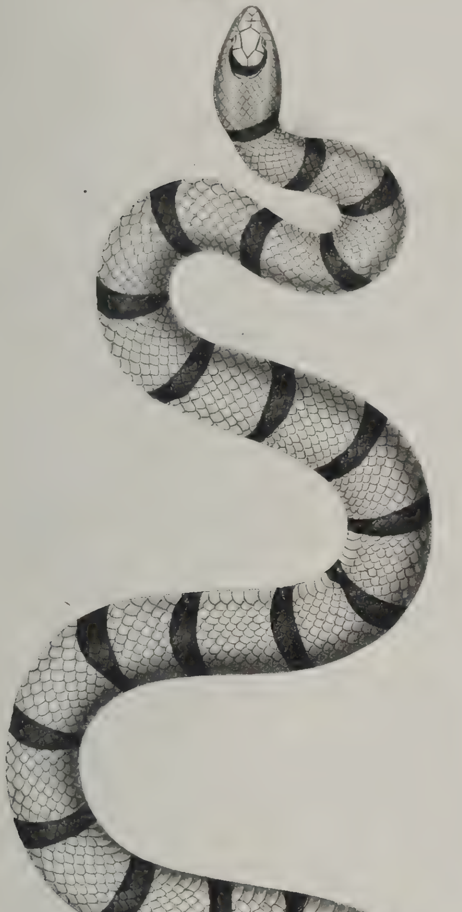


Fig 2

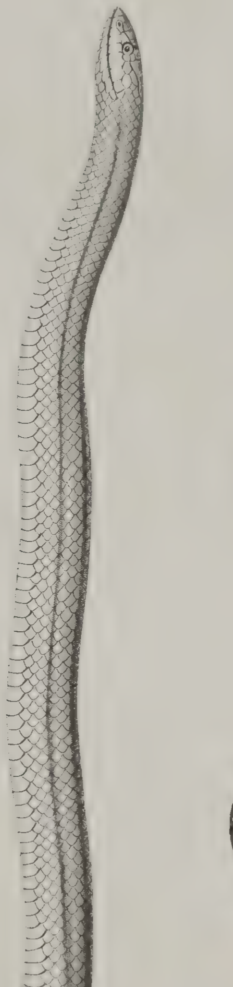
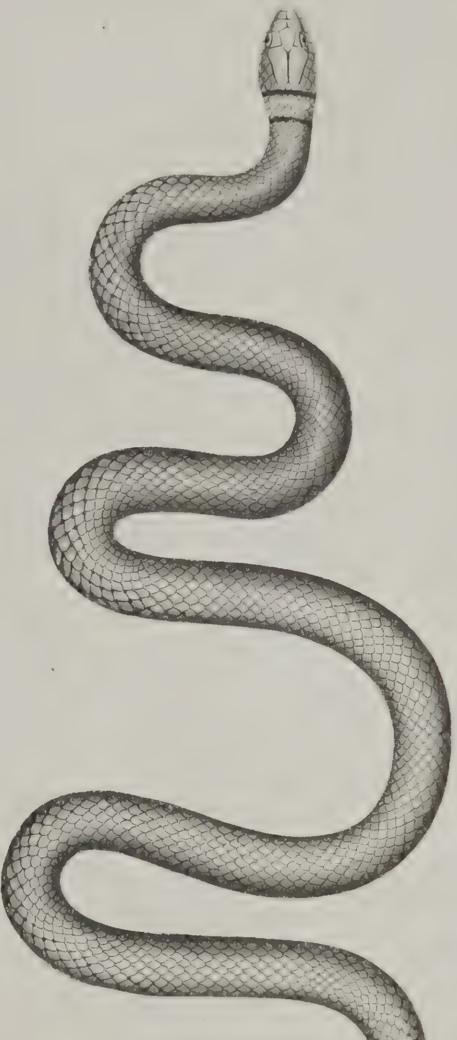


Fig 3



J. H. Richard del.

W. H. Dougal sc.

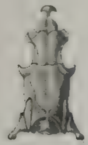


Fig. 1. a.

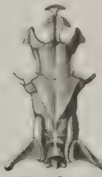


Fig. 2. a.

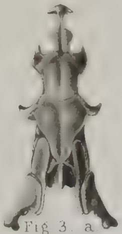


Fig. 3. a.

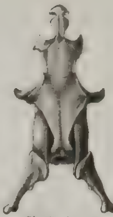


Fig. 4. a.

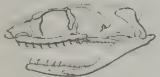


Fig. 1. b.

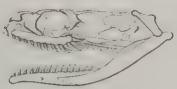


Fig. 2. b.

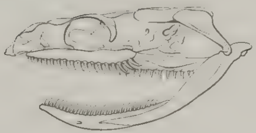


Fig. 3. b.

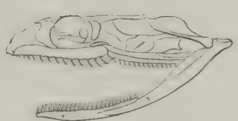


Fig. 4. b.

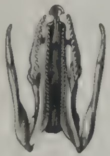


Fig. 1. c.

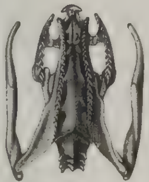


Fig. 2. c.

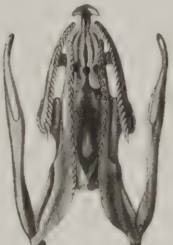


Fig. 3. c.

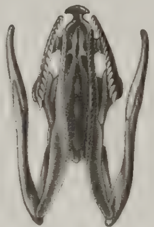


Fig. 4. c.

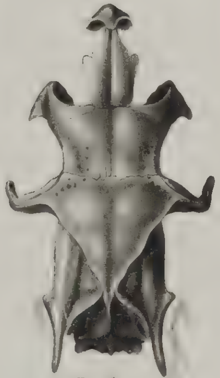


Fig. 6. a.

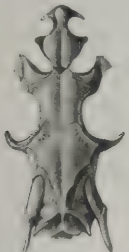


Fig. 5. a.

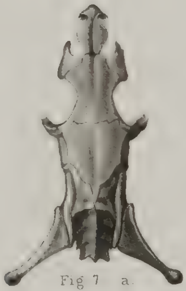


Fig. 7. a.

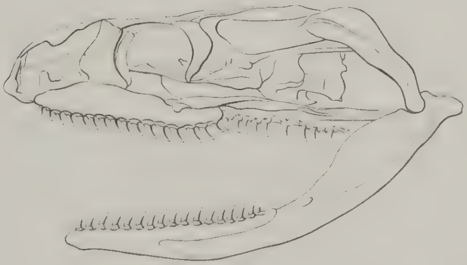


Fig. 6. b.

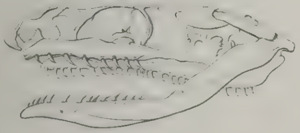


Fig. 5. b.

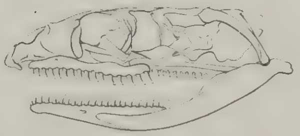


Fig. 7. b.

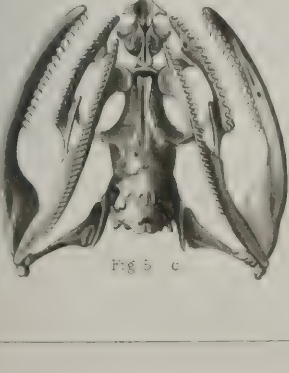


Fig. 5. c.

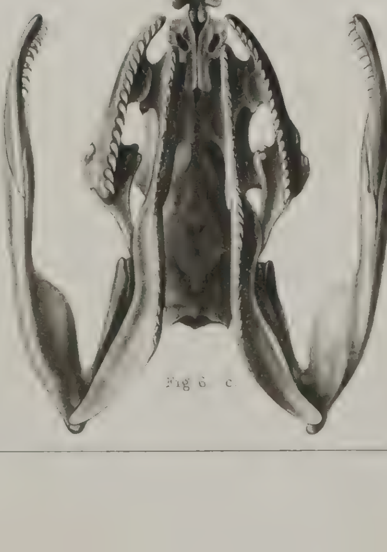


Fig. 6. c.

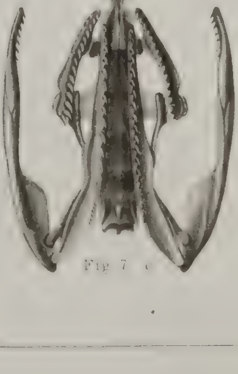
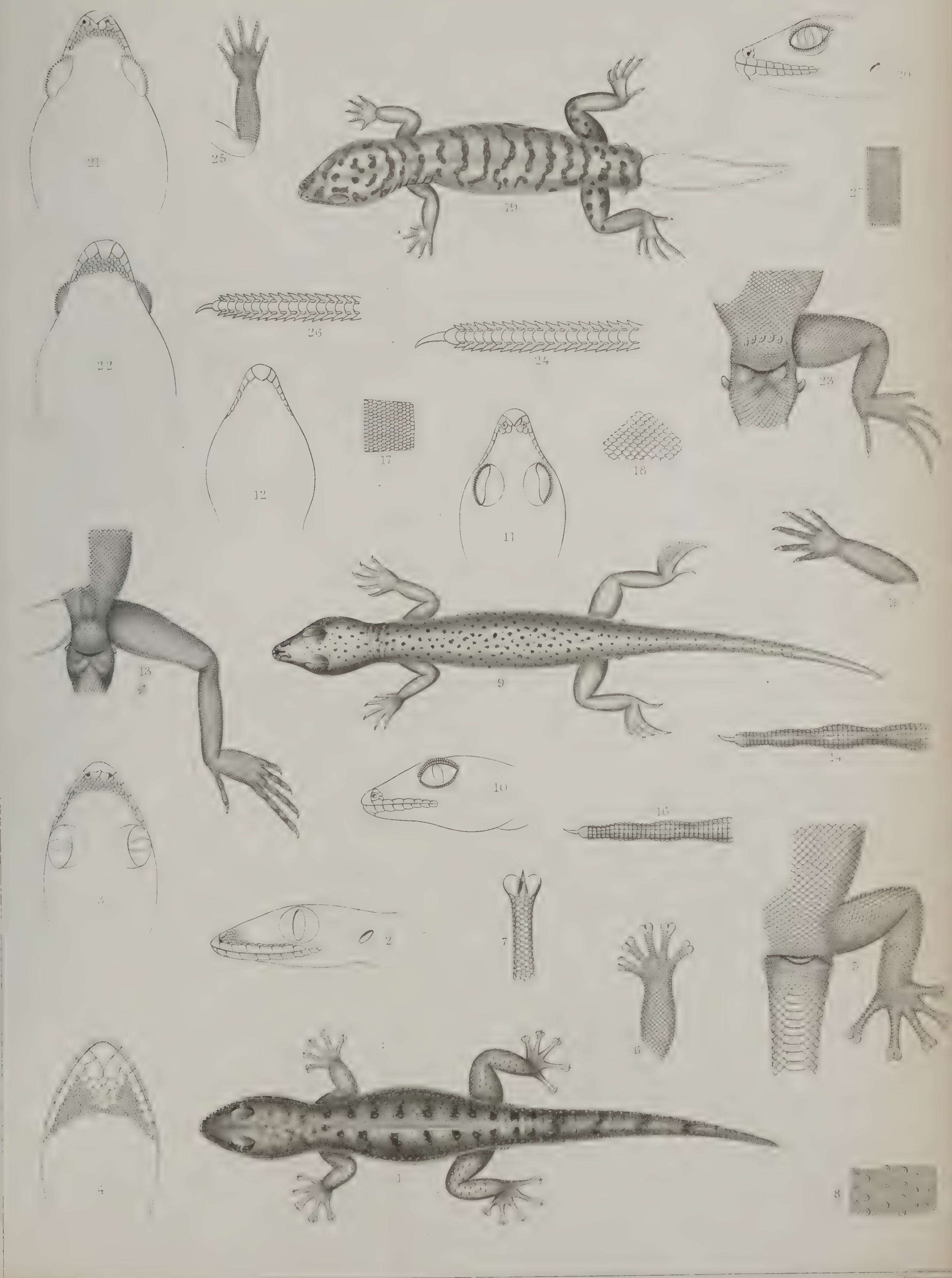
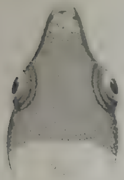


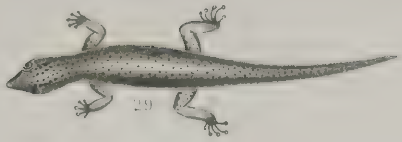
Fig. 7. c.



J. H. Richard del.

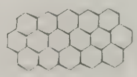


32



29

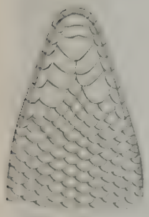
30



37

34

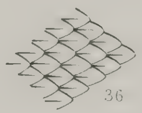
35



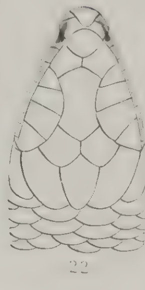
23

33

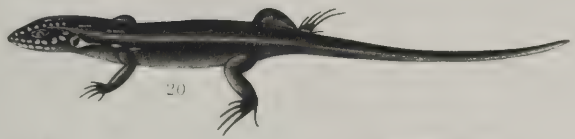
21



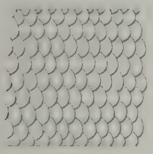
36



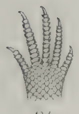
22



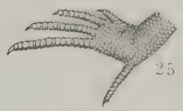
20



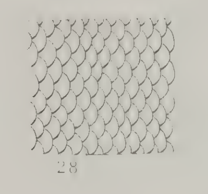
27



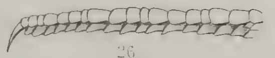
24



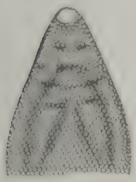
25



28

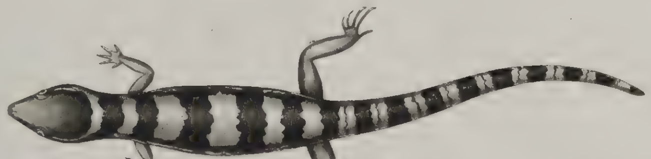


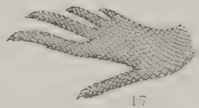
26



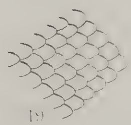
14

12



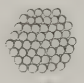


17

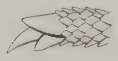


19

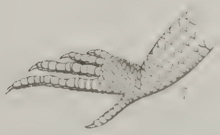
15



18

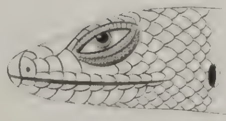


16

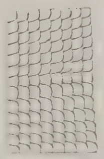


7

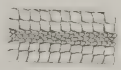
5



2

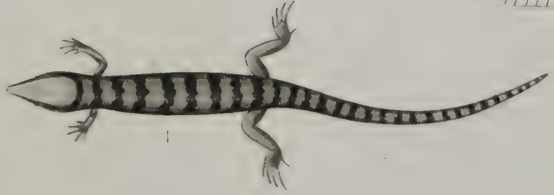


8

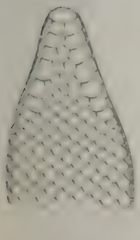


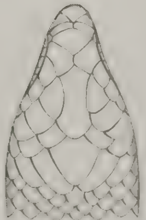
9

6



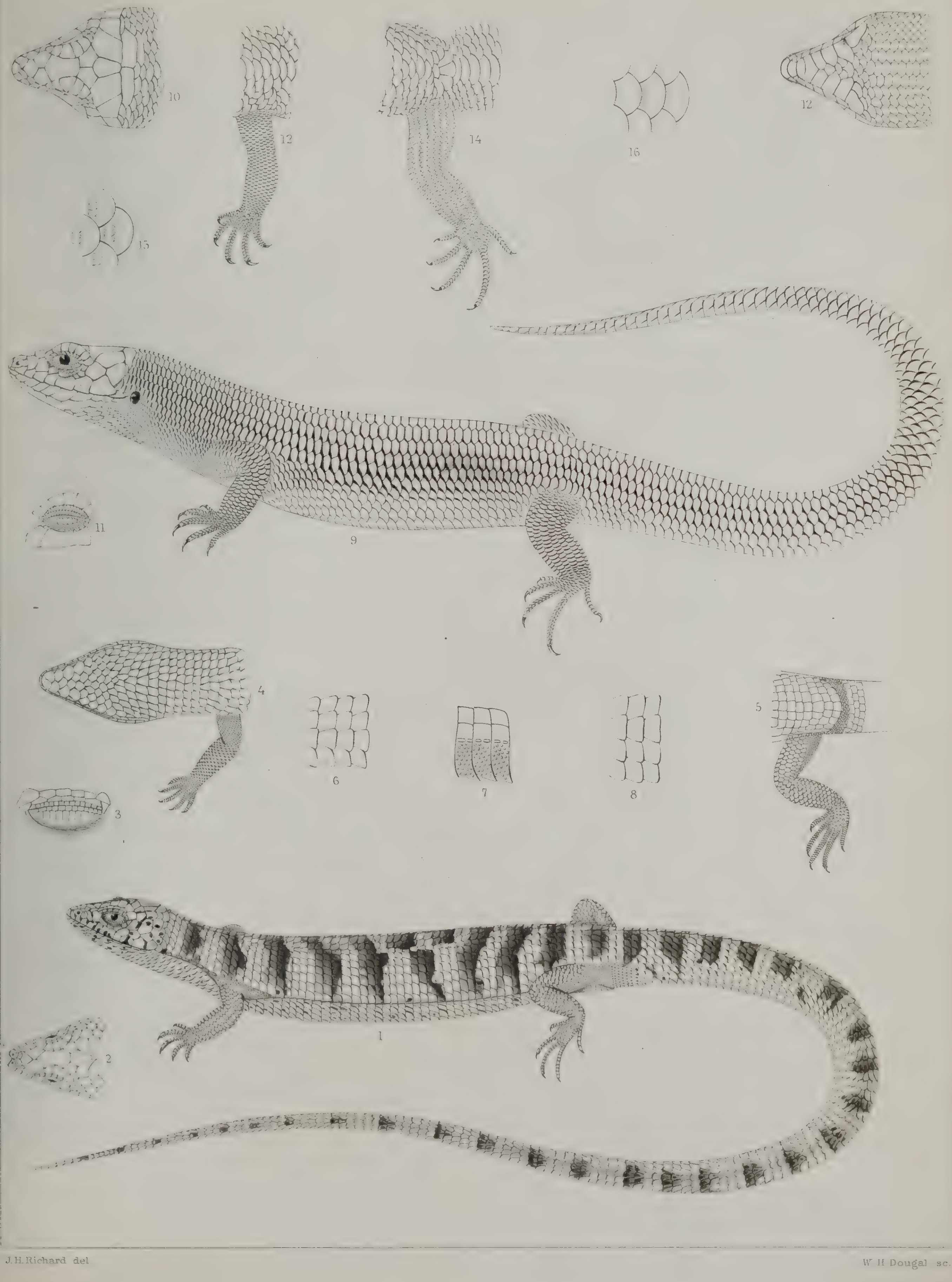
1





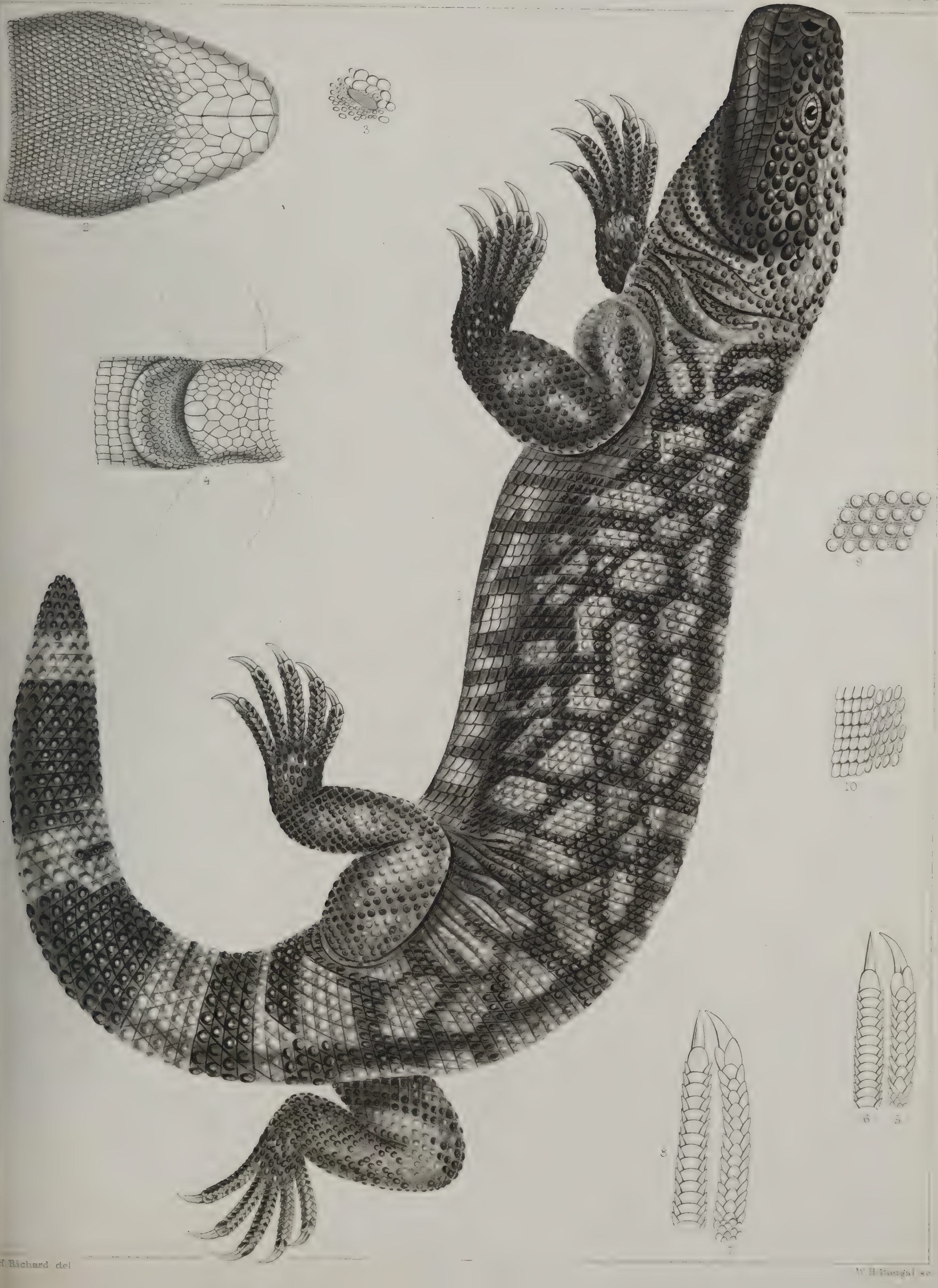
3

W. H. Dougal Sc.



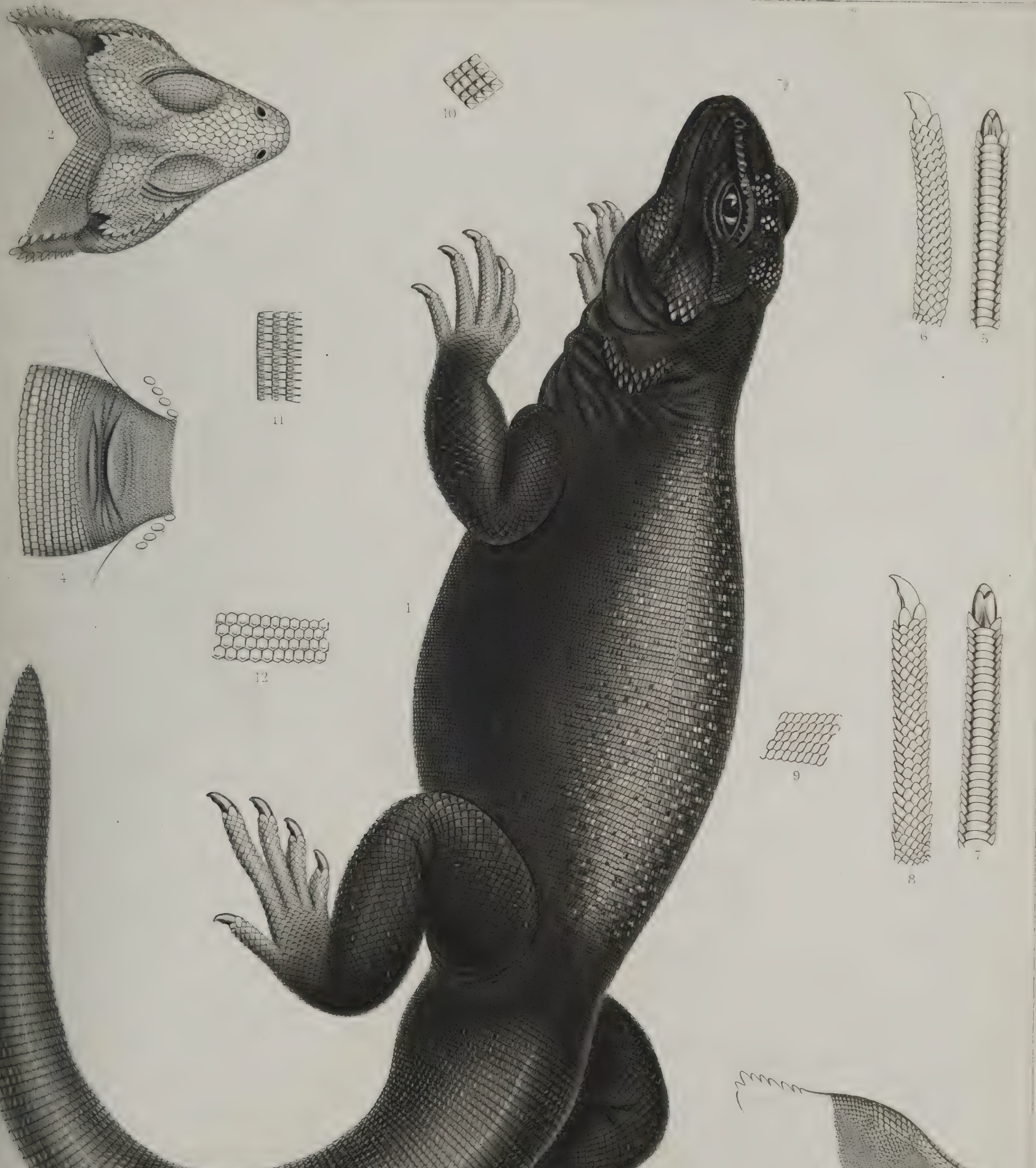
J. H. Richard del.

W. H. Dougal sc.



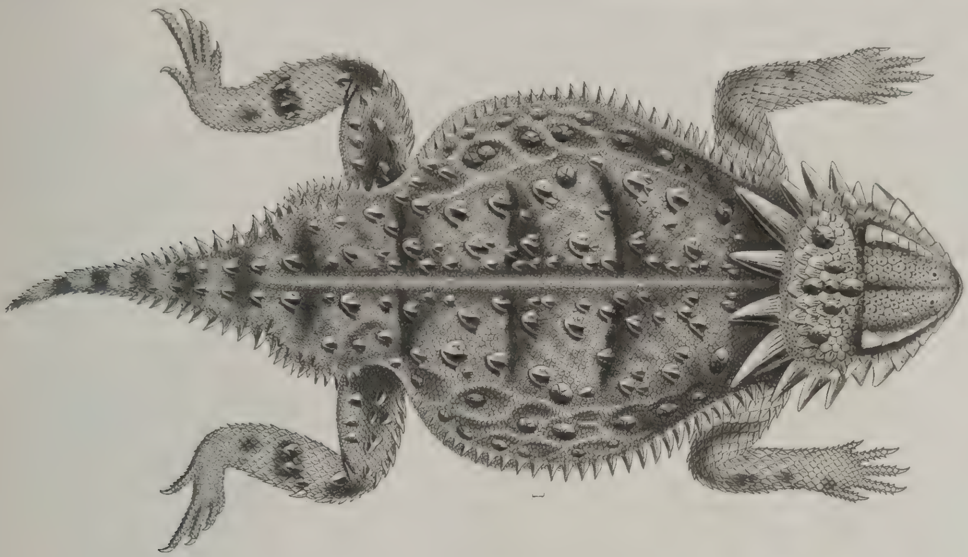
J.H. Richard del.

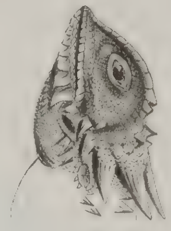
W.H. Dougal sc.

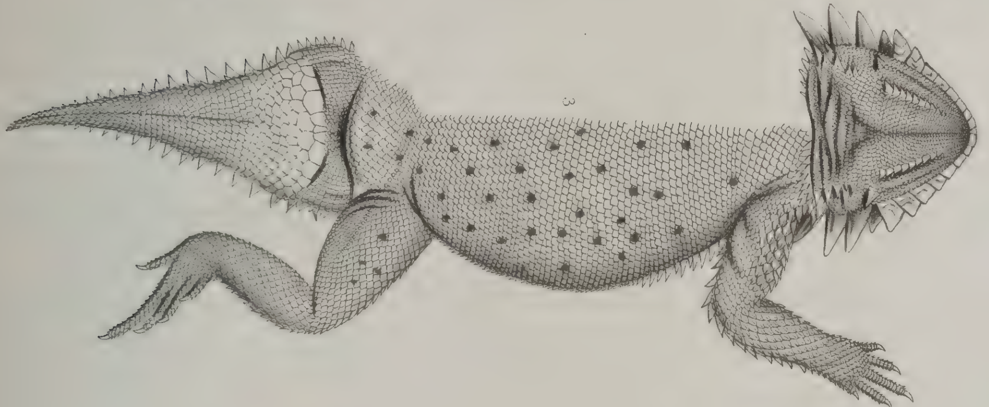


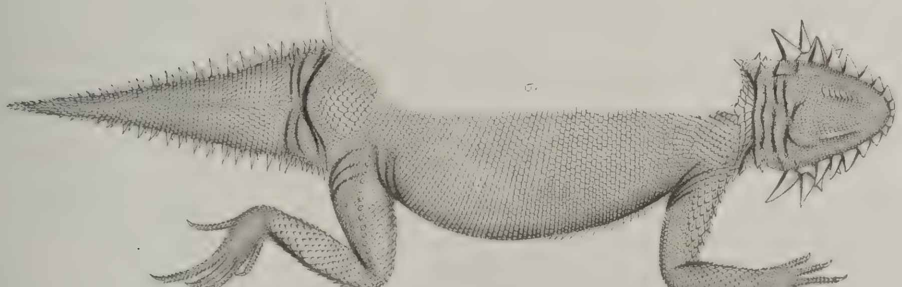
R.Richard del

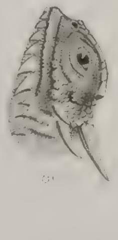
W H Dougal. sc.

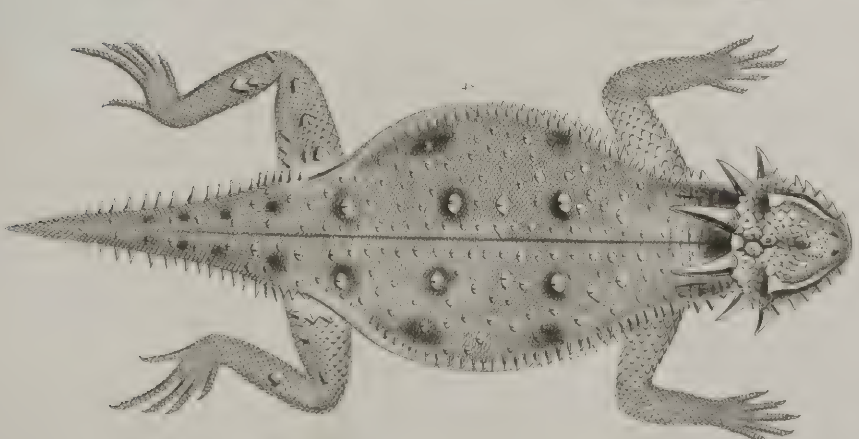






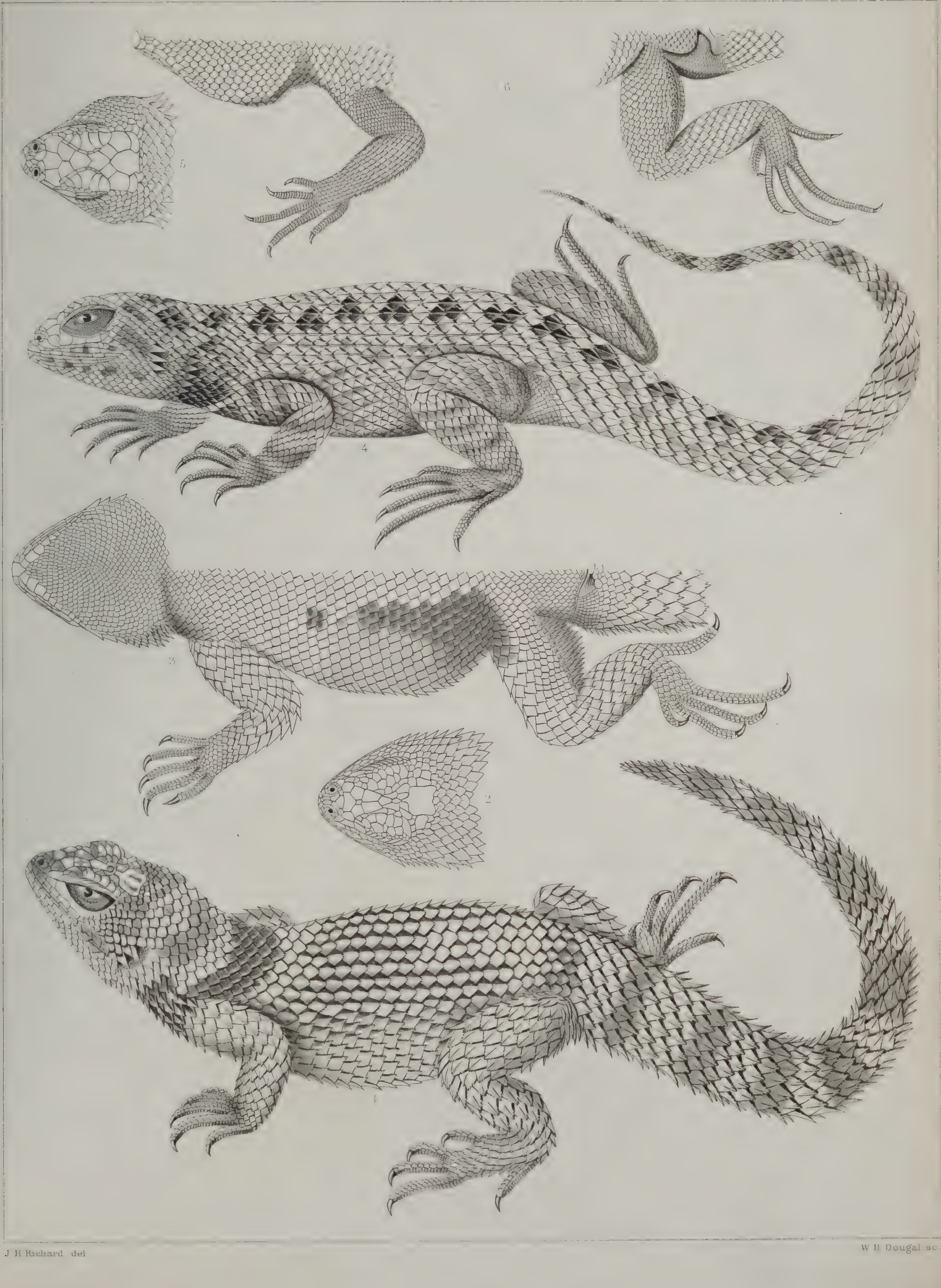






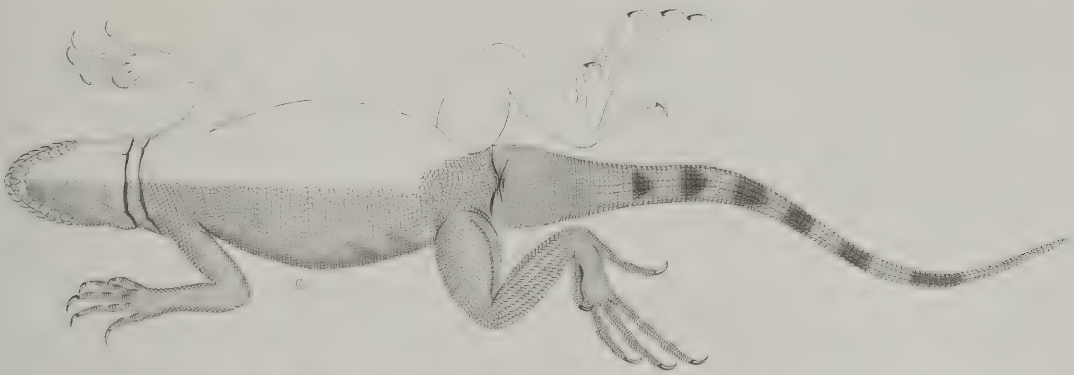
J H Richard del

W H Dougal sc



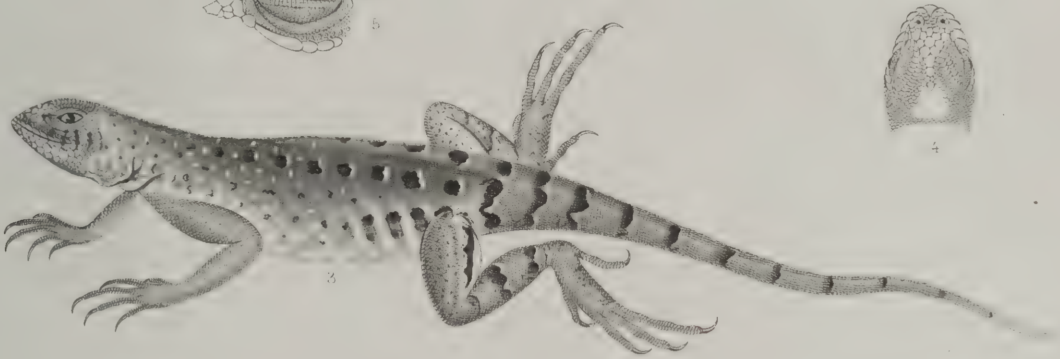
J. H. Richard del.

W. H. Dougal sc.

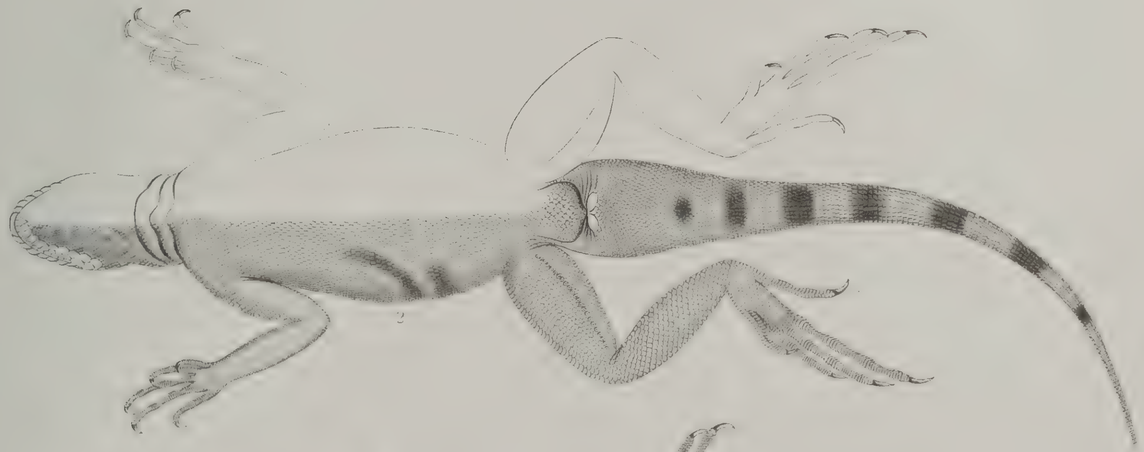

6

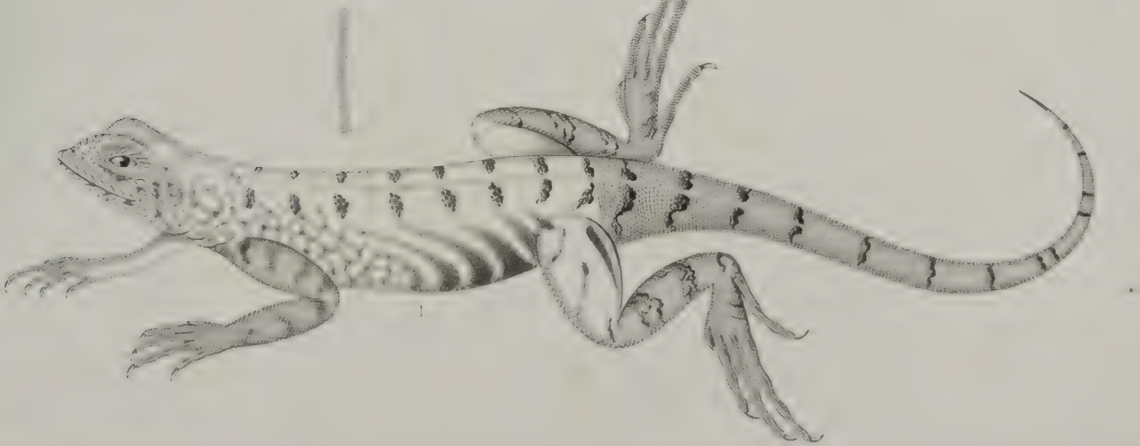
7

5

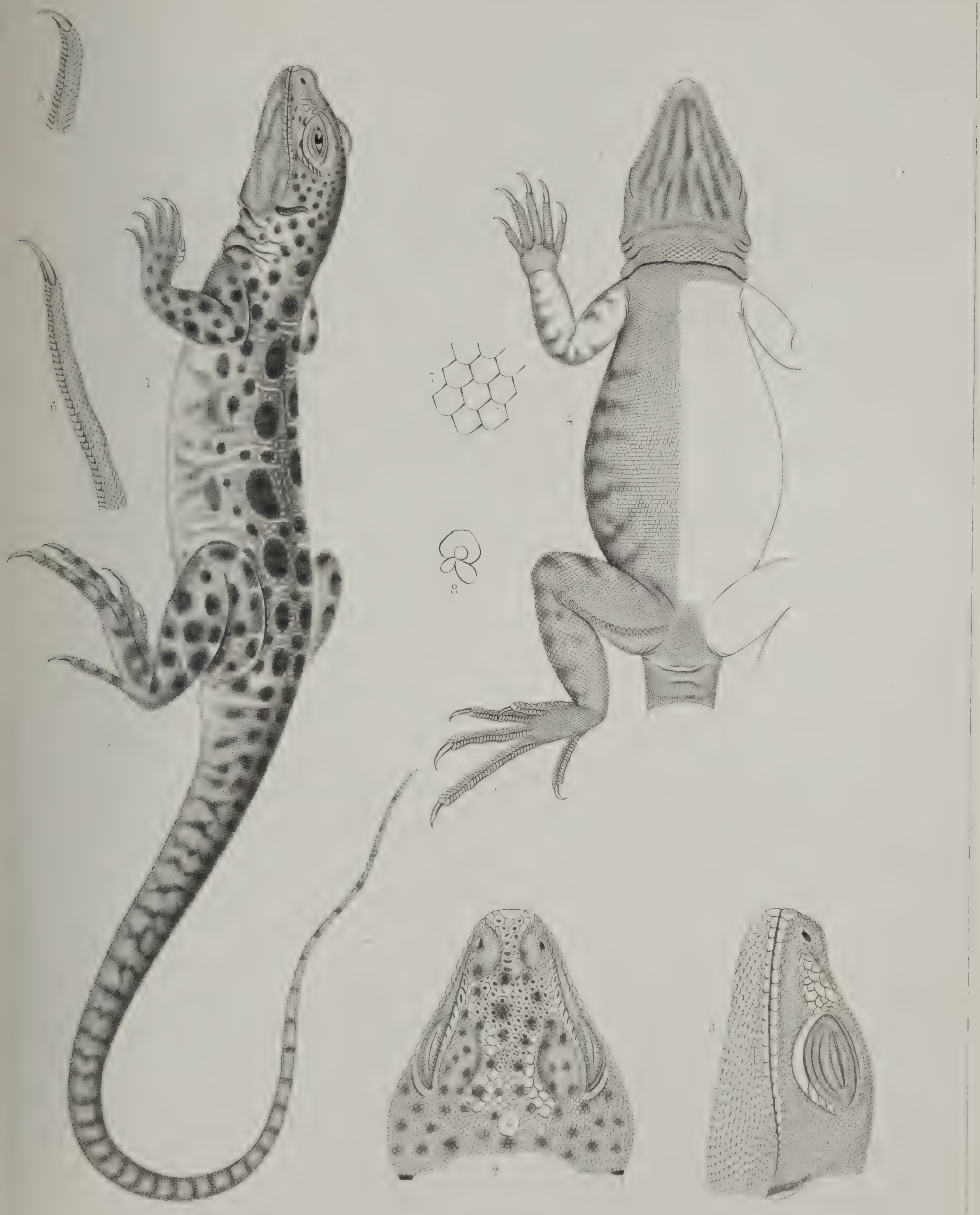

4

3

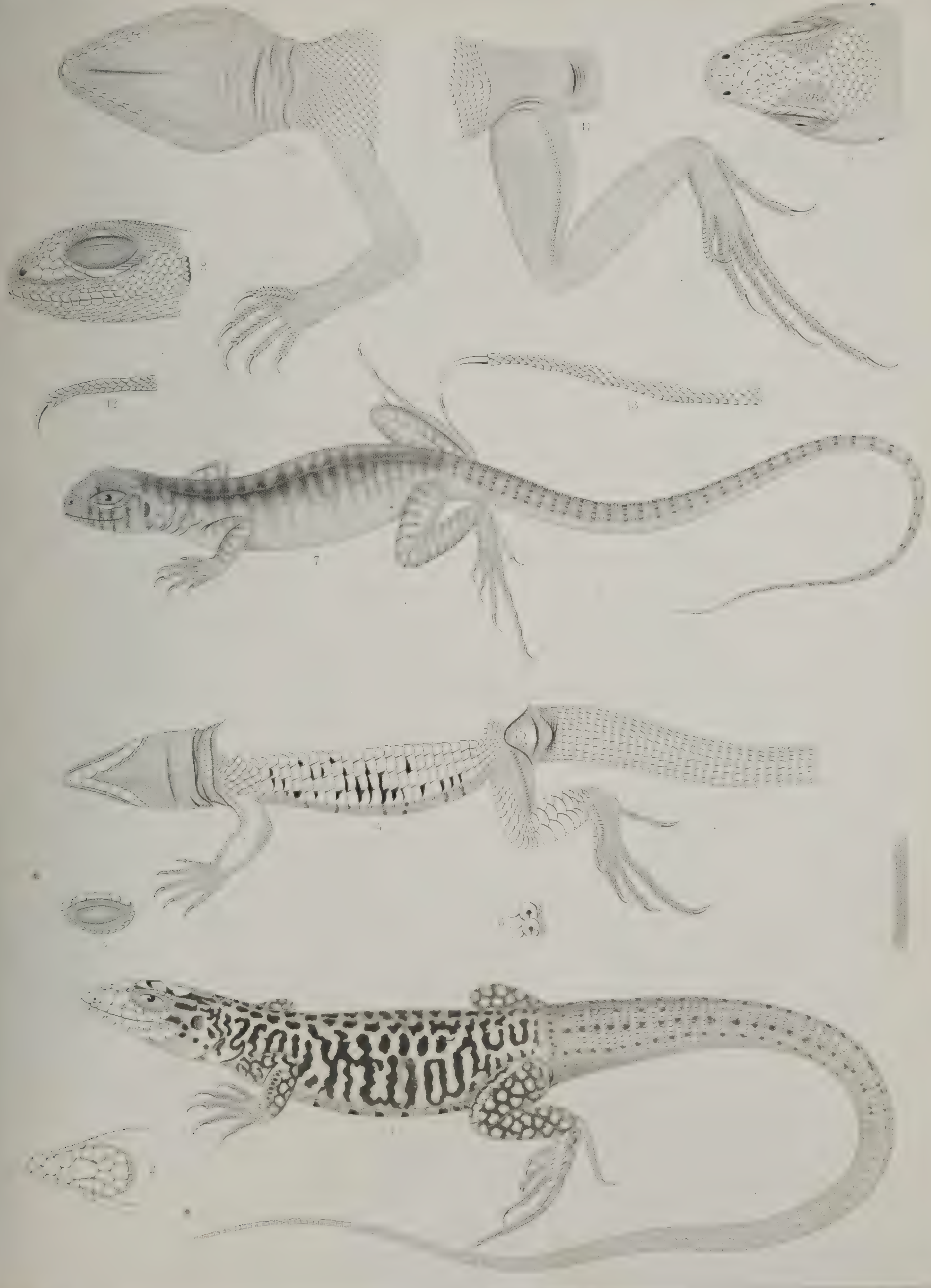

2


1

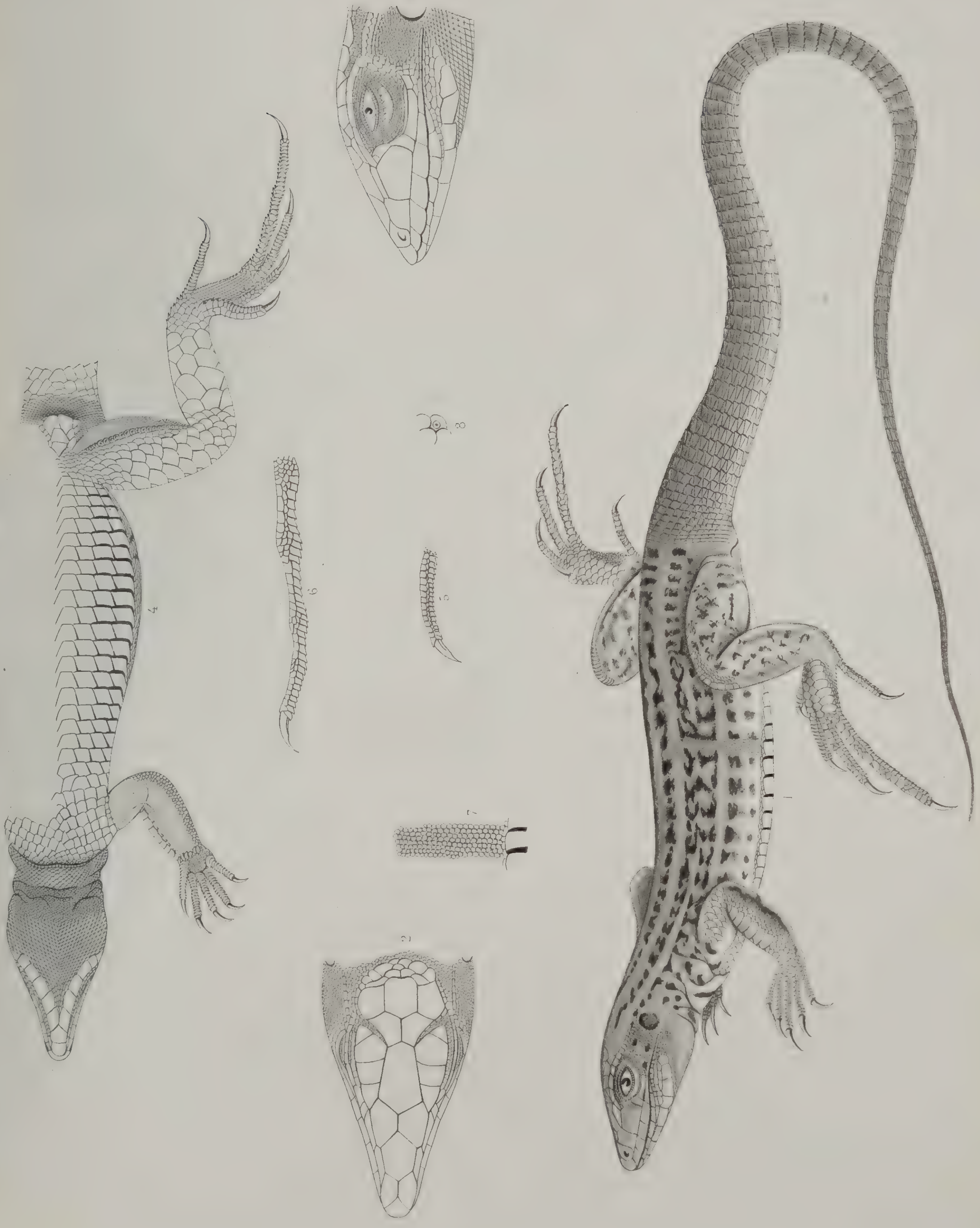
J. H. Richard del. W. H. Dougal sc.



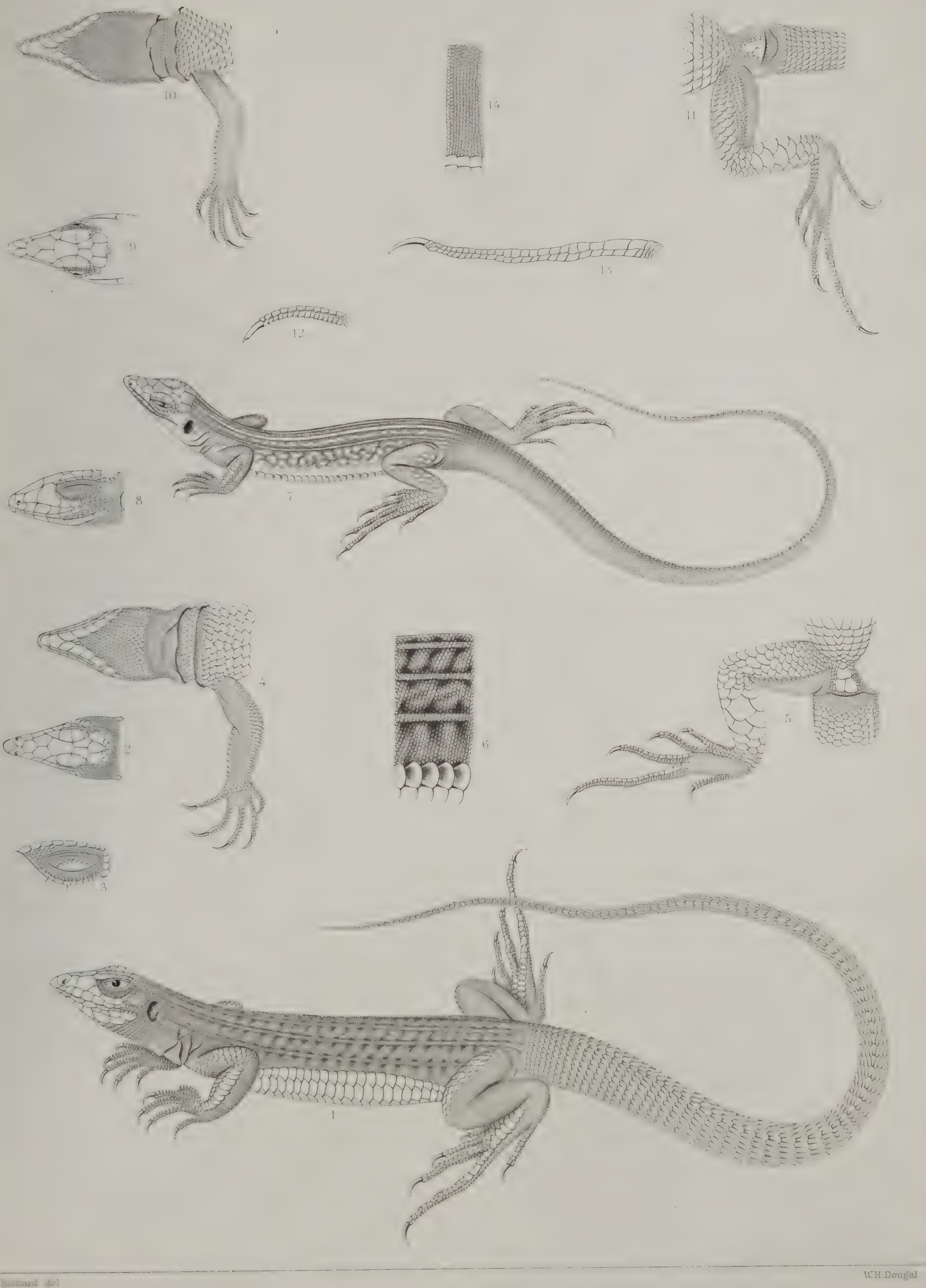
W. H. Dougal sc.



W H Dougal sc

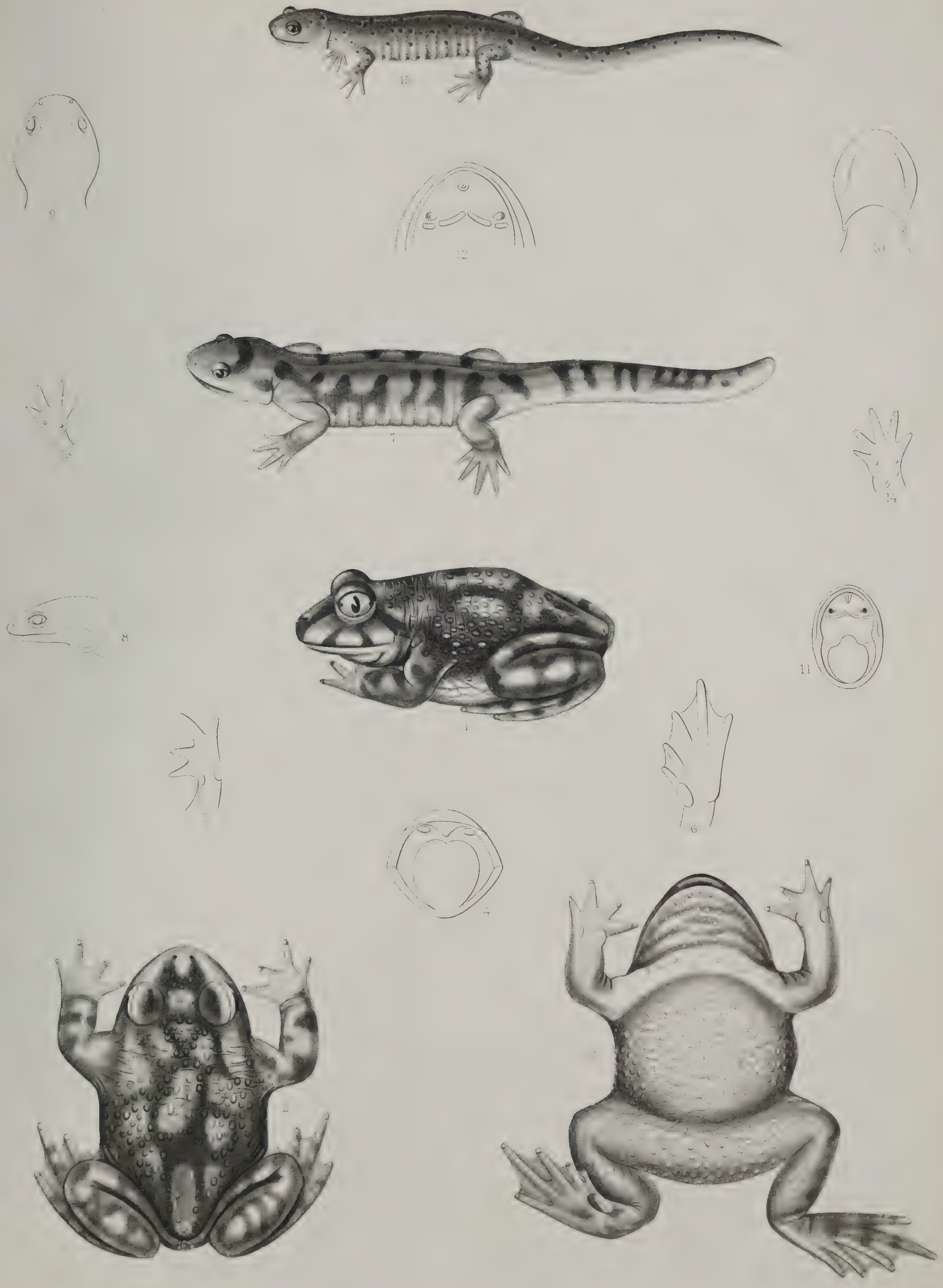


J. H. Richard del. W. H. Dougal sc.

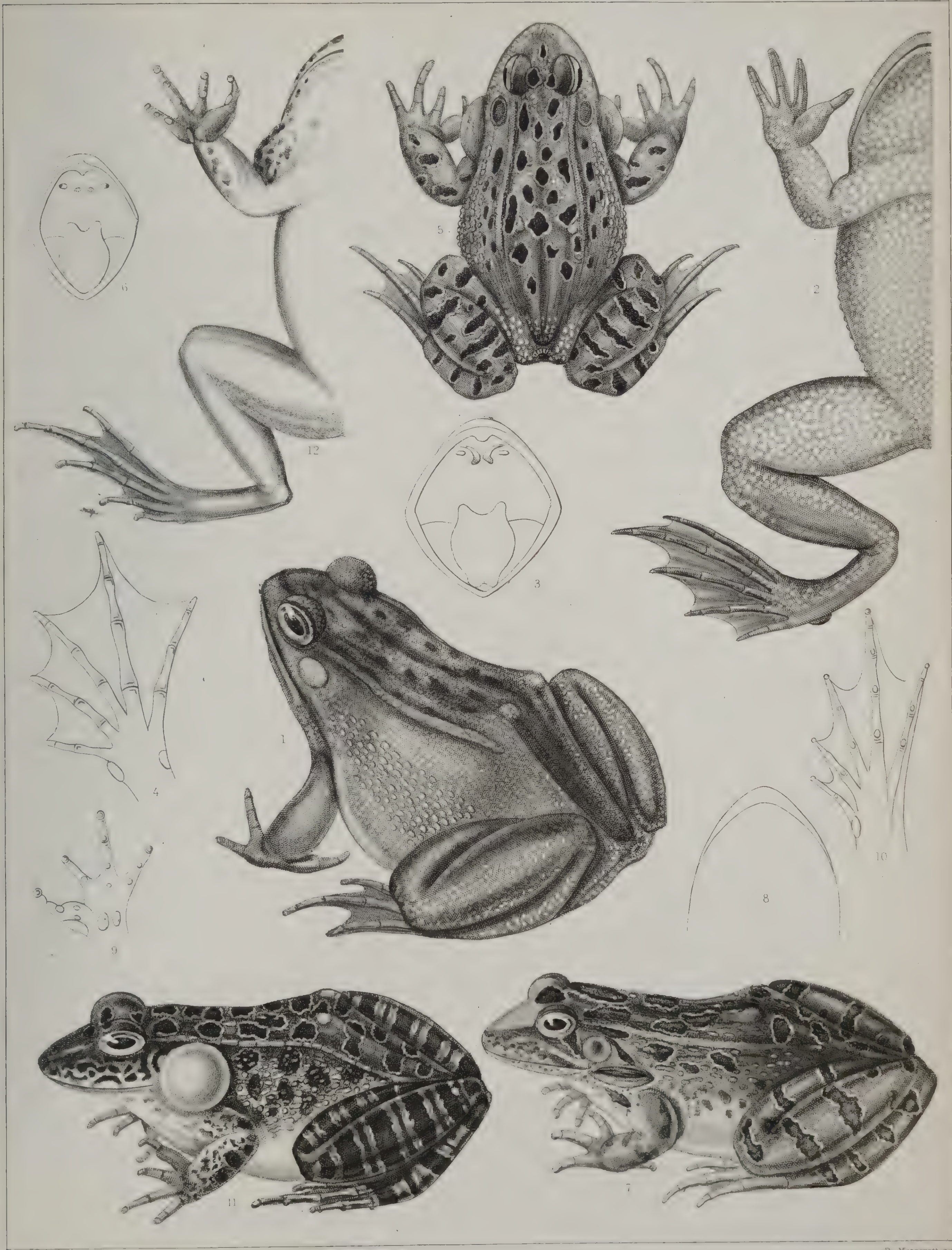


J H Richard del

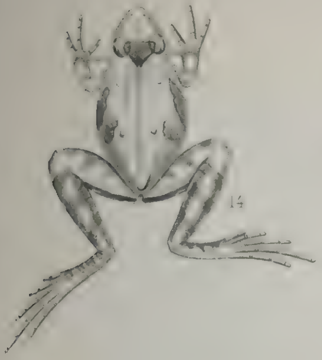
W.H.Dougal sc.

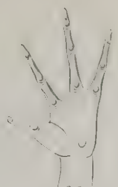


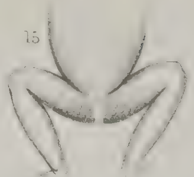
[illegible] W. H. Dougal sc.



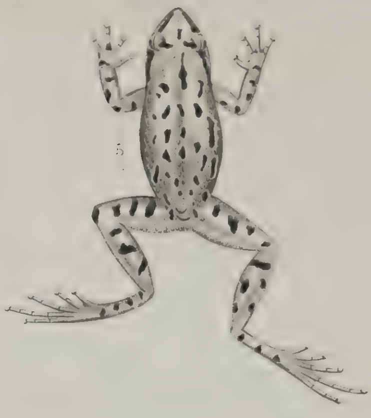
J. H. Richard del R. Metzerott sc

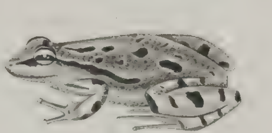

14

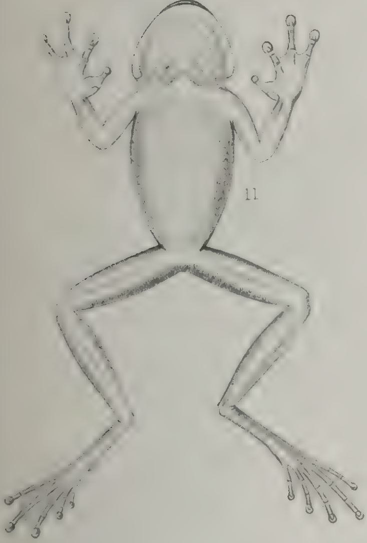

16


15

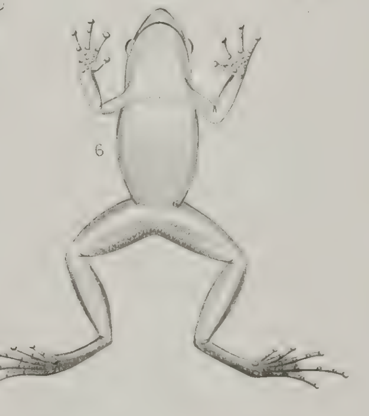
17

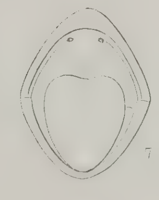

5


4


11

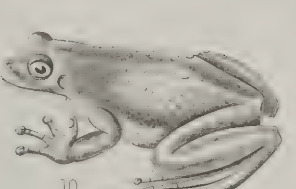
9

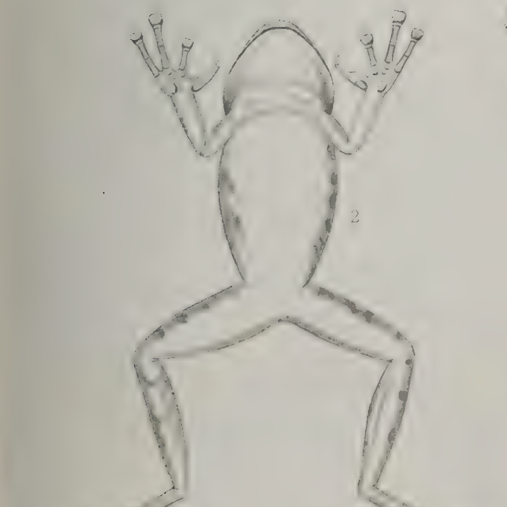

6

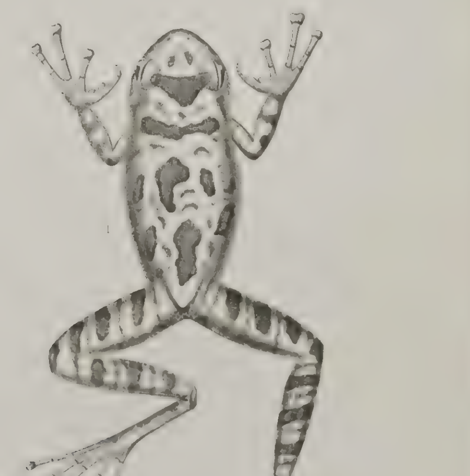

7

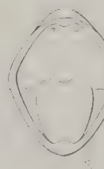
12

13

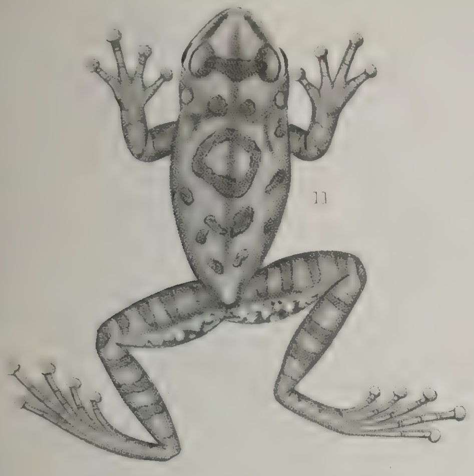

10

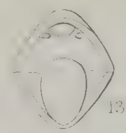

2

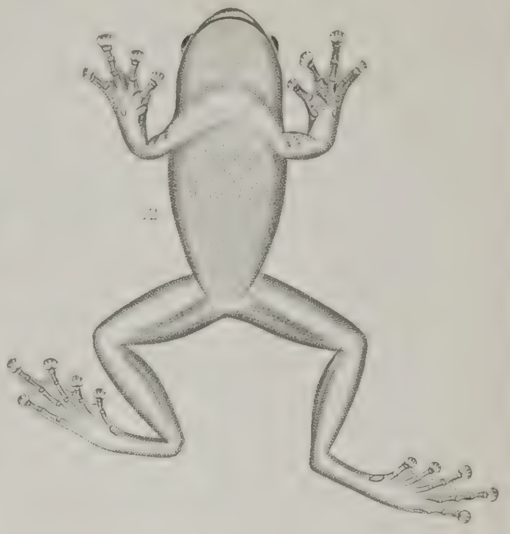

1

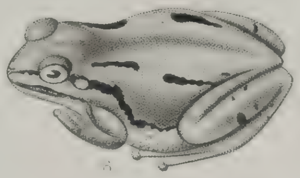

3

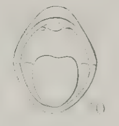
J H Richard del. W. H. Dougal sc.

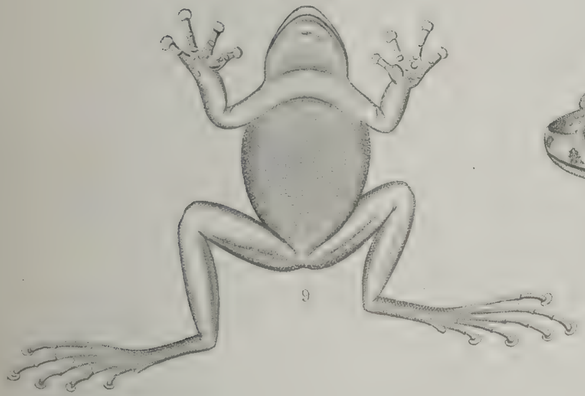

11

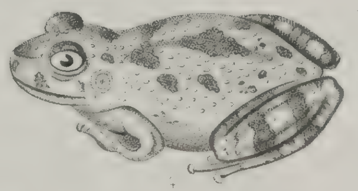

13

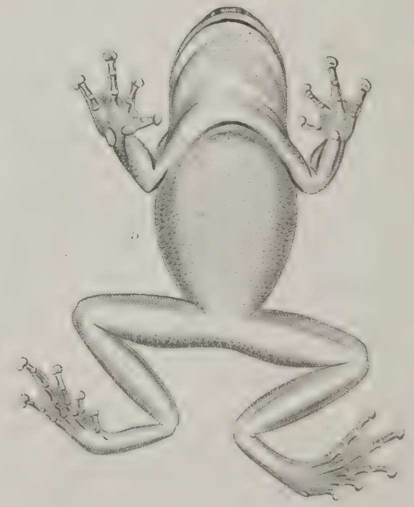

12


8

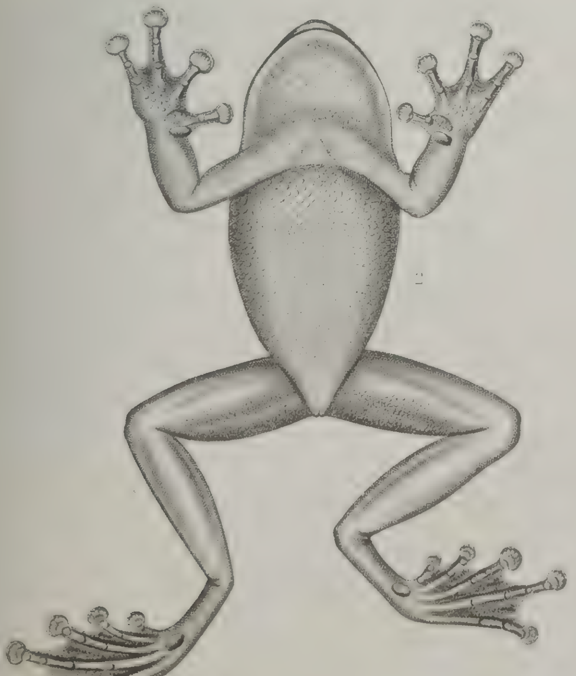

10


9

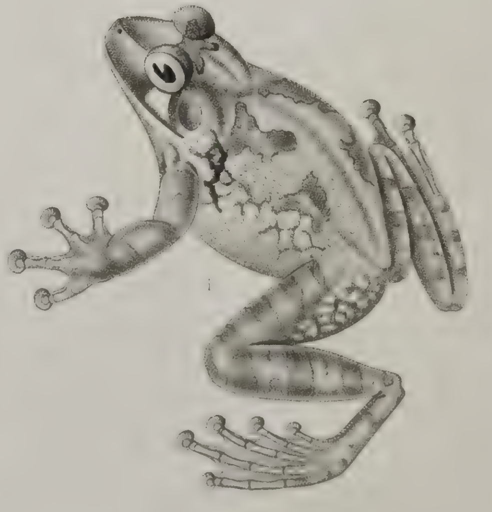

4


5

7

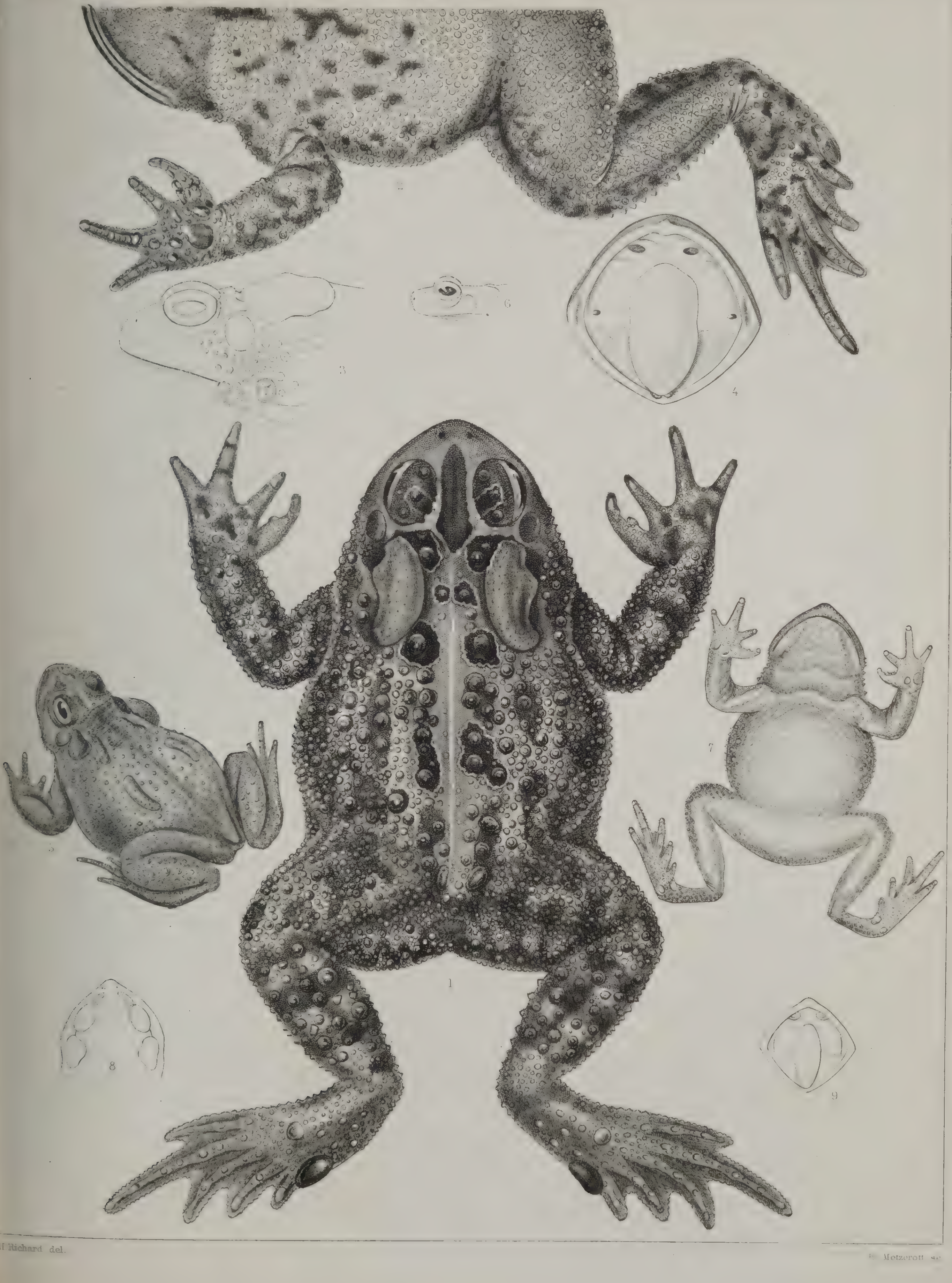

2

6

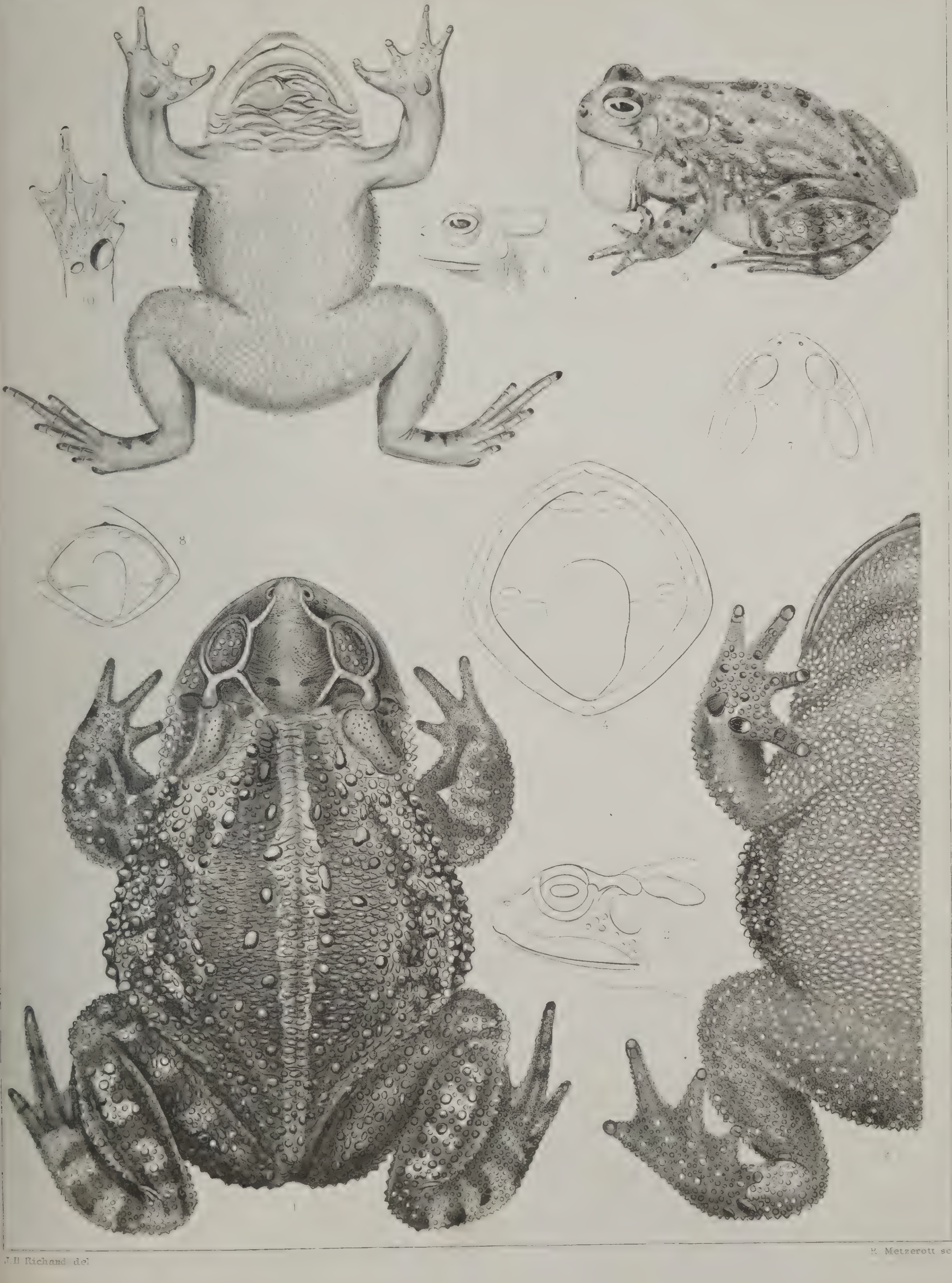

1

3

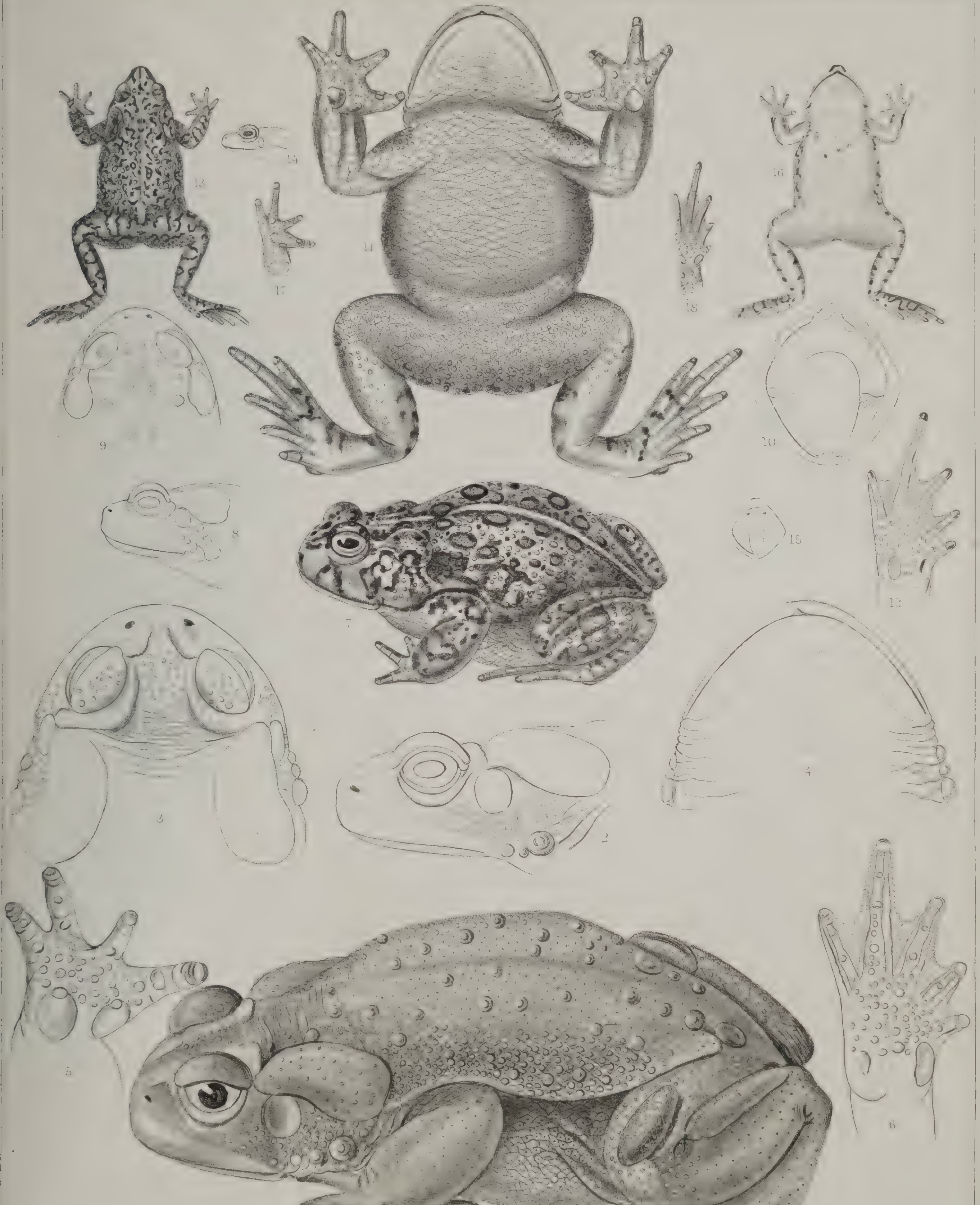
W.H. Dougal sc.



J. H. Richard del. G. Metzeroth sc.



J.H. Richard del. E. Metzerott sc.



J H Richard del. R Metzerott sc

UNITED STATES AND MEXICAN

BOUNDARY SURVEY,

UNDER THE ORDER OF

LIEUT. COL. W. H. EMORY,

MAJOR FIRST CAVALRY, AND UNITED STATES COMMISSIONER.

ICHTHYOLOGY

OF THE BOUNDARY,

BY

CHARLES GIRARD, M. D.

ICHTHYOLOGY.

Family PERCIDAE.

DIOPLITES NUECENSIS, Grd.

Trout or River Bass.

PLATE I.

SPEC. CHAR.—Body elongated, sub-fusiform. Head constituting a little less than the third of the entire length. Posterior extremity of maxillary extending to a vertical line drawn posteriorly to the orbit. Scales on the cheeks nearly equal in size to those on the gill covers. Origin of ventrals placed posteriorly to the base of the pectorals. Upper regions reddish brown, maculated. A lateral dark band. Inferior regions whitish, unicolor.

SYN.—*Grystes nuecensis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 25.

This species is more closely related to *D. fasciatus* than to *D. salmoides*, and probably identical with *Grystes nobilis*, Agass. At any rate the latter has greater affinities with *D. fasciatus* than with *D. salmoides*, the latter being restricted to its proper limits.

The body is proportionally more elongated than in *D. fasciatus*, resembling more in that respect *D. salmoides*. It is compressed and sub-fusiform when seen in profile. The greatest depth is somewhat less than the fourth of the total length, in which the head enters a little less than three times. The mouth is more deeply cleft than in any other of the known species of the genus, and its gape is, as usual, oblique upwards, owing to the constant protrusion of the lower jaw beyond the upper, which it does very prominently in this species. The posterior extremity of the maxillary is very much dilated, extending to a vertical line drawn considerably back of the whole orbit. The tongue is large and stout at its base, thinning and tapering towards its apex, which is broadly rounded; it is smooth anteriorly, being provided posteriorly and upon its middle with a narrow band of velvet-like teeth. Both nostrils are nearer the anterior rim of the orbit than the extremity of the snout; the anterior one is a little smaller than the posterior, and placed more outwardly with reference to the middle line of the snout. The eye is of moderate development, sub-circular in shape, and reaching the summit of the cranium; its diameter enters about six times and a half in the length of the side of the head: twice in advance of the anterior rim of the orbit. The opercular apparatus is perfectly smooth and deprived of either spines or serratures. The scales upon the cheeks are but slightly smaller than those covering the opercular pieces. The gill openings are wide and continuous under the throat.

The base of the first or spiny dorsal is longer than that of the first, but the fin itself is lower and more arched in its outline. The first and second spines are shorter than the third, which is the highest, the remaining ones diminishing gradually posteriorly. The tenth spine, by its position, belongs rather to the second than the first dorsal. The second dorsal is higher than long, sub-trapezoid; its upper edge being but slightly convex, and the posterior rays almost as high as the anterior ones. The posterior margin of the caudal is sub-crescentic or sub-concave; the fin itself is contained five times and a half in the total length. The origin of the anal corresponds to a vertical line intersecting the anterior third of the second dorsal; its base extends a little further back than that of the latter, although the tips of the posterior rays of both fins are nearly even, the anal being not quite so deep as the second dorsal is high; its whole base, including the three small and slender spines at its anterior margin, is shorter than that of the second dorsal. The origin of the ventrals corresponds to a vertical line drawn immediately behind the base of the pectorals. The fins themselves are broad and short, since their posterior extremity does not reach the vent which is situated a little way in advance of the anterior margin of the anal fin, and under a vertical line drawn between the two dorsal fins. The pectorals are of moderate development, not extending quite as far back as the ventrals.

Br. VI: VI; D X, 13; A III, 11; C 4, 1, 8, 8, 1, 3; V I, 5; P 15. (Rio Cibolo.)
Br. VI: VI; D X, 13; A III, 12; C 4, 1, 9, 8, 1, 3; V I, 5; P 14. (Rio Blanco.)

The scales are of moderate development, sub-oblique, deeper than long, provided with radiating grooves upon their anterior section only, and pectinated posteriorly. The pectinations of the scales of the dorsal region are either obsolete or else deciduous, and easily removed with the epidermis. As a whole the fish has a rather smooth appearance, reminding us more of a trout than a perch were it not for its anterior spiny dorsal fin. From twenty-nine to thirty longitudinal rows of scales may be counted upon the line of greatest depth, nineteen below and nine above the lateral line. The scales under the throat are quite reduced in size; those on the cheeks being nearly as large as on the opercle. Minute scales may be observed upon the caudal fin to almost three-fourths of the length of its rays, and a few scattered ones upon the base of the second dorsal. The lateral line itself, from the upper region of the gill covers, is slightly arched upwards until under the second dorsal fin, hence runs nearly straightway along the middle of the peduncle of the tail to the base of the caudal fin.

The upper regions are reddish brown, of a more or less deep hue, and maculated with dark brown or black, whilst the inferior regions are whitish or yellowish, and unicolor. A lateral, more or less interrupted, dark band may be traced from the black patch at the posterior margin of the opercle, to the base of the caudal fin. Three obsolete streaks may be seen upon the cheeks diverging from the orbit. The fins are unicolor, except the second dorsal, which exhibits two longitudinal bars upon its base; the upper ones are greyish olive, the lower ones yellowish olive.

Plate I, fig. 1, represents *Dioplites nuecensis*, size of life; fig. 2, is a scale from the dorsal region; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig. No.	Nature of specimen.
388	1	Adult	Rio Frio, Tex.	1851	Col. J. D. Graham		Alcoholic
389	1		Rio Nueces, Tex.	1851	do		do
390	1		Live Oak creek, Tex.	1851	do		do
391	1		Turkey creek, Tex.	1851	do		do
392	6	Young	Rio Leona, Tex.	1851	do		do
393	4	do	Elm creek, Tex.	1851	do		do
394	2		Texas	1851	do		do
395	5		San Juan river, N. Leon	1853	Lieut D. N. Couch		do
503	1	Young	Rio Sabinal, Texas	Nov., 1854	Maj. Emory	60	do
504	4	do	Dry creek, Tex.	Nov., 1854	do	55	do
505	1	do	San Pedro creek, Tex.	Nov., 1854	do	110	do
506	1	do	Minneville river, Tex.	Nov , 1854	do	52	do

CALLIURUS LONGULUS, Grd.

PLATE IV, FIGS. 1—4.

SPEC. CHAR.—Mouth moderate; gape oblique upwards. Posterior extremity of maxillary extending to a vertical line intersecting the pupil. Eyes moderate. Insertion of ventrals situated opposite the inferior edge of the base of the pectorals, and posteriorly to the origin of the dorsal; their tips extending to the vent. Scales moderate. Reddish brown above; greyish beneath. Soft portion of dorsal and anal fins provided with a black patch.

SYN.—*Pomotis longulus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 391; and, in *Marcy's* Expl. Red river of La. 1853, 245, pl. xii.

Bryttus longulus, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 25.

This species is described, illustrated, and compared to its congeners in the "Ichthyology of the U. S. P. R. R. Explorations and Surveys."

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig. No.	Nature of specimen.	Collected by—
405	2	Adult.	Rio Cibolo, Texas	1851	Col. J. D. Graham	6	Alcoholic.	John H. Clark
406	4	do	Minneville Rio, Texas	1854	Maj. Emory		do	Dr. C. B. Kennerly.

1. POMOTIS SPECIOSUS, B. & G.

PLATE IV, FIGS. 5—8.

SPEC. CHAR.—Body sub-elliptical in profile. Head small; snout bluntly sub-conical. Mouth small; posterior extremity of maxillary extending to the anterior rim of the orbit. Inferior edge of preorbital and limb of preopercle finely serrated. Auricular flap small. Spinous portion of dorsal fin elevated. Anal spines well developed. Caudal emarginated. Reddish brown, lighter beneath. Young transversely banded. Fins greyish or yellowish; a black patch upon the dorsal.

SYN.—*Pomotis speciosus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 24.

The greatest depth is equal to half the length, the caudal fin excluded. The head constitutes less than the fourth of the total length, and the caudal fin about the fifth. The eye is subcircular, its diameter entering four times and a half in the length of the side of the head. The inferior edge of the preorbital is finely serrated, as well as the edge of the convexity of the preopercle. A vertical line drawn from the origin of the dorsal fin meets the insertion of the ventrals and passes behind the base of the pectorals. The tips of the ventrals overlap the vent and reach the origin of the anal. The extremities of the pectorals are nearly even with the tips of the ventrals. The posterior margin of the caudal is but slightly emarginated. The soft portion of the dorsal fin is nearly equal to that of the anal; the outline alone varying somewhat. The vent is situated opposite the eighth dorsal spine.

Br. VI: V; D X, 11; A III, 11; C 4, 1, 8, 7, 1, 3; V I, 5; P 12.

The scales are well developed, and, as usual, deeper than long, posteriorly ciliated or pectinated, and anteriorly furrowed. Fourteen longitudinal series may be counted upon the line of greatest depth below the lateral line, and six above it, making in all twenty-one series. The lateral itself is composed of from forty to forty-three scales.

The color is reddish brown, lighter beneath than above. The young exhibit numerous transverse bands of brown or black, which give way to a uniform tint as they grow older. The fins are yellowish or greyish and unicolor, except the dorsal, which is provided posteriorly with a large black patch. The anal and ventrals are, generally speaking, of a greyish hue.

Plate IV, fig. 5, represents *Pomotis speciosus*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig. No.	Nature of specimen.	Collected by—
432	3	Adult.	Brownsville, Texas	1852	Capt. Van Vliet.....	1 & 2	Alcoholic.	Capt. Van Vliet.....
434	24	Young	Devil's river, Texas.......	1854	Maj. Emory..........	63	....do....	Dr. C. B. Kennerly..
435	3	..do..	Cadereita, New Leon......	1853	D. N. Couch..........	23	....do....	D. N. Couch.......
482	5	..do..	Brownsville, Texas	1852	Capt. Van Vliet......	......	....do....	Capt. Van Vliet....

2. POMOTIS HEROS, B. & G.

PLATE II, FIGS. 1—4.

SPEC. CHAR.—Head, mouth, and eye larger than in *P. speciosus*. Edge of preopercle inconspicuously serrated. Pectorals projecting beyond the tips of ventrals; anal fin provided occasionally with a black patch, as well as the dorsal.

SYN.—*Pomotis heros*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 25

With the general physiognomy of *P. speciosus*, this species differs, however, from the one just mentioned, by a proportionally larger head, hence a larger eye and a larger mouth. The posterior extremity of the maxillary extends a little beyond the anterior rim of the orbit. The edge of the preopercle is but inconspicuously if at all serrated, and the opercular flap of but moderate development.

The head constitutes about the fourth of the total length, and the diameter of the eye enters a little short of four times in the length of the side of the head. The nape is more or less convex, and the interocular region depressed. Five rows of scales may be counted upon the cheeks beneath the eye. The pectoral fins are sub-lanceolated ; their extremities extending beyond the tips of ventrals and the anterior margin of the anal fin. The ventrals themselves overlap the vent and reach the origin of the anal. The origin of the dorsal fin is opposite the base of the pectorals, and, consequently, situated in advance of the insertion of the ventrals. The scales are large and finely serrated upon their posterior margin. The radiating furrows of the anterior section are quite numerous. The posterior margin of the caudal is more deeply emarginated than in *P. speciosus*.

Br. VI : V ; D X, 12 ; A III, 11 ; C 3, 1, 8, 7, 1, 2 ; V I, 5 ; P 13.

The scales are large and finely pectinated upon their posterior margin. They appear proportionally deeper than in *P. speciosus*. Small and polymorphic scales may be traced along the base of the caudal fin and soft portion of the dorsal and anal, as is the case also in *P. speciosus* and most species of the genus.

The color is reddish brown, sometimes blackish brown. The auricular flap is provided with a light postero-inferior margin. The tint upon the sides of the head is uniform with that of the sides of the body. The dorsal is provided posteriorly with a dark patch or blotch. A black patch may occasionally be observed at the posterior margin of the anal fin also. The young are unicolor.

Plate II, fig. 1, represents *Pomotis heros*, size of life ; fig. 2 is a scale from the dorsal region ; fig. 3, a scale from the lateral line ; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig. No.	Nature of specimen.	Collected by—
438	4	Adult.	Rio Cibolo, Texas.............	1851	Col. J. D. Graham.	......	Alcoholic.	Jno. H. Clark.......
440	8	Young	Dry creek, near Victoria, Texa	1854	Maj. Emory......	54	....do....	Dr. C. B. Kennerly.
441	1	..do..	..........do..................	1854	......do..........	56	....do....	......do............
442	7	..do..	..........do..................	1854	......do..........	53	....do....	......do............
443	12	..do..	Rio San Juan and near Cadereita, N. L.	1852	D. N. Couch.....	15 & 19	....do....	D. N. Couch.......

3. POMOTIS AQUILENSIS, B. & G.

PLATE III, FIGS. 1—8.

SPEC. CHAR.—Body sub-elliptical in profile. Head moderate ; snout bluntly sub-conical. Mouth moderate ; posterior extremity of maxillary extending to a line intersecting the anterior rim of the orbit. Eye moderate. Edge of preopercle slightly denticulated or serrated. Auricular flap elongated and well developed. Spinous portion of dorsal fin elevated or else of medium height. Anal spines well developed. Extremities of pectorals not extending as far back as those of the ventrals which overlap the vent and reach the anterior margin of the anal fin. Reddish brown ; fins greyish olive, unicolor ; dorsal and anal provided with a black patch.

SYN.—*Pomotis aquilensis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 387.
Pomotis nefastus, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 24.

Resembles very much *P. speciosus* in general appearance, having sometimes, in common with the latter, the spinous portion of its dorsal fin quite elevated, it being then higher, or equal at the least, to the soft portion, which occupies the two-fifths of the base. Generally, however, it is of but moderate height. The caudal fin, which constitutes about the fifth of the total length, is more emarginated posteriorly than in *P. speciosus*.

The body, when viewed in profile, is more elliptical, more elongated proportionally, than in *P. speciosus*. The head constitutes rather more than the third of the length, the caudal fin being excluded. The eye is of medium size and sub-circular; its diameter entering three times and a half in the length of the side of the head, less than once in advance of its anterior rim. The scales on the cheeks are more numerous than in *P. speciosus*, and a good deal smaller than on the opercle. The mouth is larger than in the latter mentioned species; the posterior extremity of the maxillary extending to a vertical line intersecting the anterior rim of the orbit. The opercular flap is elongated, sometimes considerably developed, being prolonged posteriorly and inclining downwards without tapering. This feature is quite peculiar to this species.

The ventrals and pectorals are elongated, the latter not extending quite as far back as the former, which, however, overlap the vent and reach the origin of the anal fin.

Br. VI : VI; D X or XI, 11; A III, 10; C 4, 1, 8, 7, 1, 3; V I, 5; P 14.

The scales in the first variety (figs. 6—8) are as deep as long upon their posterior margin, which is sub-truncated; they are narrower posteriorly and rounded. In the second variety (figs. 2—4) they do not taper off posteriorly. The radiating furrows and the pectinations are numerous, each upon their respective section.

The ground color, as preserved in alcohol, is uniform reddish brown; the base of the ventrals, anal, and dorsal exhibiting a large, sometimes diffused, black patch.

This is as polymorphic a species as *P. fallax*; two of its extreme forms are represented on plate III; fig. 5 being the one first described as *P. aquilensis*, and fig. 1 as *P. nefastus*. They are both figured size of life.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected	Whence obtained.	Orig. No.	Nature of specimen.	Collected by—
446	1	Young.	Eagle Pass	1853	Maj. Emory		Alcoholic.	A. Schott.
447	1	...do...	San Felipe, Texas	1851	Col. J. D. Graham		....do....	Jno. H. Clark
448	5	Adult.	Rio Cibolo, Texas	1851	........do		....do....	......do
449	10	Young.	Rio Nueces, Texas	1851	........do		....do....	......do
450	24	...do...	Rio Sabinal, Texas	1854	Maj. Emory	62	....do....	Dr. C. B. Kennerly.
451	12	...do...	........do	1854	........do	61	....do....	......do

4. POMOTIS FALLAX, B. & G.

PLATE II, FIGS. 5—8, & PLATE III, FIGS. 9—12.

SPEC. CHAR.—Body sub-circular or sub-elliptical; head moderate; snout bluntly sub-conical. Mouth large; posterior extremity of maxillary extending to the anterior rim of the pupil. Eye moderate. Edge of preopercle not crenated. Auricular flap very large. Spinous portion of dorsal of medium height, its origin situated opposite the base of the pectorals; caudal emarginated posteriorly. Blackish or reddish brown, lighter beneath than above. Sides of head with bluish spots, sometimes confluent into irregular lines. A black spot upon the base of the dorsal fin.

SYN.—*Pomotis fallax*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 24.
Pomotis convexifrons, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 24.

A comparative study of a larger number of specimens than we had heretofore has satisfied us that *P. convexifrons* was identical with *P. fallax*. The latter appears to be one of the most polymorphic species of the genus, and we have deemed it expedient to give figures and outlines of the most prominent forms on Plate X, of the U. S. R. R. Expl. and Surveys, as a more sure guide to future researches.

It is, therefore, difficult to take into account the form of the body in a specific point of view. Generally speaking, however, it is sub-circular or sub-elliptical; the head being of but moderate development compared to the other species, constituting the third of the length, the caudal fin excluded. The snout is bluntly sub-conical. The mouth itself is proportionally large, obliquely directed upwards. The posterior extremity of the maxillary extends to a vertical line intersecting the anterior rim of the pupil. The eye is of moderate development, circular in form; its diameter entering about four times in the length of the side of the head, or else a little less. The edge of the preopercle is not crenated. The opercular appendage, on the other hand, is very large when fully developed, reaching even abnormal proportions. The origin of the dorsal fin is situated opposite the upper edge of the base of the pectoral fins; its spinous portion is of medium height, with its outline more or less arched, it being subjected to some variations; it is always lower than the soft portion. The caudal is moderately emarginated posteriorly. The tip of the ventrals overlap the vent and reach the anterior margin of the anal. The external soft ray becomes filamentous in the adult and then projects beyond the anterior margin of the latter mentioned fin. The pectorals are rather broad, and their extremity does not extend as far back as the tip of the ventrals. The posterior extremities of both dorsal and anal fins fall evenly with the same vertical line.

D X, 11; A III, 9; C 3, 1, 8, 7, 1, 2; V I, 5; P 14. (Elm creek.)
X, 11; III, 9; 3, 1, 8, 7, 1, 2; I, 5; 13. (Rio Cibolo.—*P. convexifrons.*)

The scales are of moderate development, sub-hemispherical, rounded posteriorly, superiorly, and inferiorly, and truncated or sub-truncated anteriorly; always deeper than long. The pectinations are often carried away with the epidermis.

The color is either blackish or reddish brown, lighter beneath than above. The sides of the head exhibit bluish spots, which are sometimes confluent into irregular lines. The opercular flap is margined by a narrow light filet, whilst a black spot is occasionally observed upon the base of the soft portion of the dorsal fin posteriorly.

Plate II, fig. 5, represents *Pomotis fallax*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and fig. 8, a scale from the abdominal region.

Plate III, fig. 9, represents, size of life, the variety which we have formerly described as a species under the name of *Pomotis convexifrons;* fig. 10 is a scale from the dorsal region; fig. 11, a scale from the lateral line; and fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig'l No.	Nature of specimen.	Collected by—
457	2	Adult.	Rio Cibolo, Texas.......	1851	Col. J. D. Graham...	......	Alcoholic.	Jno. H. Clark........
458	1	..do..	Elm Creek, Texas.......	1851	......do..............	......	....do....	......do..............
459	5	Young	Rio Salado, Texas.......	1851	......do..............	......	....do....	......do..............
460	6	..do..	Live Oak creek, Texas..	1854	Major Emory.........	64	....do....	Dr. C. B. Kennerly....
461	5	..do..	San Pedro creek, Texas..	1854	......do..............	59	....do....	......do..............

Amongst other fresh water percoids collected by the Commission we have further to mention *Calliurus melanops*, Grd., as having been collected in 1854 by Dr. Kennerly, in the Dry creek Texas, and in San Pedro creek, Texas.

Of the marine tribe of the same family specimens of *Centropomus undecimalis*, CUV. & VAL., were collected by Jno. H. Clark, near the mouth of the Rio Grande del Norte (Rio Bravo).

amily ETHEOSTOMIDAE.

Exclusively limited to the fresh waters of the northern portion of the western hemisphere, the fishes of this family have not yet been made the subject of any researches beyond the establishment of some genera and the naming of sundry species. Their intimate structure, by which alone their natural affinities can be traced, is left for future investigations, which we hope, ere long, to be able to undertake. The materials on hand are already very numerous.

PILEOMA CARBONARIA, B. & G.

PLATE VIII, FIGS. 10—13.

SPEC. CHAR.—Body elongated, sub-fusiform, compressed ; peduncle of the tail slightly contracted upon its middle. Head constitution about the fifth of the total length ; snout sub-conical ; posterior extremity of maxillary extending to a vertical line drawn in advance of the anterior rim of the orbit. The eye is well developed, sub-circular in shape, its diameter being contained four times and a half in the length of the side of the head. The anterior dorsal is longer than high, and approximates closely the second dorsal, which is somewhat higher than the first, and likewise longer than high. Two short spines may be observed at the anterior margin of the anal fin. The posterior margin of the caudal is sub-concave. The ventrals, inserted somewhat in advance of the anterior margin of the dorsal, are sub-lanceolated and their extremities extend further back than those of the pectorals. The pectorals themselves are rather broad and sub-elliptical.

SYN.—*Pileoma carbonaria*, B. & G in Proc. Acad. Nat. Sc. Philad. VI, 1853, 387.

The scales are nearly as long as deep, anteriorly sub-truncated with radiating furrows, whilst their posterior edge is rounded and provided with largely developed spines or pectinations.

Br. VI: VI; D XV, 13 ; A II, 9 ; C 3, 1, 8, 7, 1, 2 ; V I, 5 ; P 13.

The ground color is reddish yellow with transverse bars of black. A black spot may be seen at the base of the caudal, which is barred. The base of the dorsals, the anal, and the ventrals, is black also. The pectorals being unicolor.

Plate VIII, fig. 10, represents *Pileoma carbonaria*, size of life ; fig. 11 is a scale from the dorsal region ; fig. 12, a scale from the lateral line ; and, fig. 13, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
740	7	Adult.	Rio Salado, Texas......	1851	Col. J. D. Graham ...	Alcoholic.	Jno. H. Clark ....
741	1	...do ..	Rio Medina, Texas......	1851	......do..............	....do....	......do.............
742	1	...do...	San Pedro creek, Texas..	1854	Major Emory.........	....do....	Dr. C. B. Kennerly....

POECILICHTHYS LEPIDUS, Grd.

Plate VIII, Figs. 14—17.

Spec. Char.—Body compressed, rather thick upon its middle region, and attenuated towards both extremities. The head is subconical, forming about the fourth of the entire length. The jaws are equal; the mouth being moderate, the posterior extremity of the maxillary reaching a vertical line intersecting the anterior rim of the orbit. The eye is large and circular, its diameter entering about four times in the length of the side of the head. The first dorsal fin is quite low and longer than the second. The ventrals and the anal being rather small.

Syn.—*Boleosoma lepida*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 388.

The color is reddish brown with indistinct transverse blackish bands or bars; the base of the scales is black also. The dorsals and caudal are mottled or barred, whilst the remaining fins are unicolor. A vertically elongated spot may be observed beneath the eye.

D IX 11; A II, 6; C 3, 1, 6, 5, 1, 2; V I, 5; P 14.

Plate VIII, fig. 14, represents *Pœcilichthys lepidus*, size of life; fig. 15 is a front view of the open mouth, showing the maxillar teeth; fig. 16, an outline of the fish seen from above; and, fig. 17, a section of the body across the line of greatest depth.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
744	8	Adult.	Rio Leona, Texas......	1851	Col. J. D. Graham...	Alcoholic	Jno. H. Clark........

Family BATRACHIDAE.

Several specimens of toad fishes were collected at Indianola, Texas, in 1851, by John H. Clark, under Col. J. D. Graham. As far as a hasty examination of them would permit, we have identified the species with *Batrachus tau*, Cuv. & Val. Hist. nat. Poiss. XII, 1837, 478.

Family SCIAENIDAE.

The want of space forbids us working up descriptions of the following species of this family:

1. Otolithus nothus, Holbr.—Specimens collected at Brazos Santiago, Texas, by Lieutenant D. N. Couch.

2. Leiostomus obliquus, DeKay.—Specimens collected at Brazos Santiago, Texas, by G. Würdemann, and at Indianola, by John H. Clark, under Colonel J. D. Graham.

3. Homoprion lanceolatus, Holbr.—Specimens collected at St. Joseph's Island, Texas, by G. Würdemann.

4. Homoprion xanthurus, Holbr.—Specimens collected at the Brazos, by John H. Clark, under Major Emory, and at St. Joseph's Island, by G. Würdemann.

5. Conodon antillanus, Cuv. & Val.—Specimens collected at Brazos Santiago, Texas, by G. Würdemann.

6. Pogonias fasciatus, Lacép.—Specimens collected at Brazos Santiago, Texas, by G. Würdemann.

7. Sargus ovis, Cuv. & Val.—Specimens collected at Indianola, Texas, by John H. Clark, under Colonel Graham; at New Orleans, by Lieutenant Couch; at the Brazos, by John H. Clark, under Major Emory, and by G. Würdemann; also at Indianola, Texas, by Dr. C. B. Kennerly.

OTOLITHUS DRUMMONDI, Richards.

Drummond's Weak Fish.

PLATE VI.

SPEC. CHAR.—Head constituting the fourth of the entire length ; the body being gracefully elongated and fusiform in its profile. The posterior extremity of the maxillary extends to a vertical line drawn across the posterior rim of the orbit. The eye is of medium size, sub-elliptical ; its longitudinal diameter entering about seven times in the length of the side of the head. The posterior margin of the caudal is rounded in the young and sub-truncated in the adult, obscurely trilobed, arising from the fact that the central rays of that fin are somewhat longer than those of the middle of either lobe.

SYN.—*Otolithus drummondi*, RICHARDS. Faun. Bor. Amer. III, 1836, 70.—DEKAY, N. Y. Faun. IV, 1842, 72.—STORER, Synops. 1846, 66.

The scales are of but moderate development, very finely pectinated upon their posterior section, and provided with diverging furrows upon their anterior section. The dorsal region is dark or greyish brown, with small, rounded, blackish brown spots above the lateral line and on the second dorsal and caudal ; much more numerous in the young than in the old. The sides of the head and body, as well as the abdomen, exhibit a silvery tint. The anal fin is greyish ; the pectorals and ventrals yellowish.

Br. VII : VII ; D IX, I, 25 ; A I, 12 ; C 2, 1, 8, 7, 1, 3 ; V I, 5; P 16.

There are two canine teeth to the upper jaw in the majority of the specimens which we have examined, and we are satisfied that when one only is observed the other was accidentally broken.

Plate VI, fig. 1, represents *Otolithus drummondi*, reduced in size from a specimen nearly fifteen inches in total length ; fig 2 is a scale from the dorsal region ; fig. 3, a scale from the lateral line ; and fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When col'td.	Whence obtained.	Nature of specimen.	Collected by—
614	1	Adult.	Indianola, Texas	1851	Col. J. D. Graham	Alcoholic.	John H. Clark
615	1		do	1853	Major Emory	do	do
616	1		Brazos	1854	do	do	Dr. C. B. Kennerly
617	2	Young	Brazos Santiago	1853	G. Würdemann	do	G. Würdemann
618	1	Adult.	New Orleans, La	1853	D. N. Couch	do	D. N. Couch

AMBLODON NEGLECTUS, Grd.

PLATE V, FIGS. 6—10.

SPEC. CHAR.—Profile of the head sloping evenly from the occiput to the snout, which is sub-conical and rounded. Posterior extremity of maxillar bone extending to a vertical line which would intersect the middle of the pupil. Extremities of ventral fins projecting somewhat beyond those of the pectorals and reaching the vent. Second anal spine very stout. Caudal fin posteriorly convex. Upper regions reddish brown ; sides and belly silvery. Fins unicolor. Dorsals and caudal greyish olive ; anal, ventrals, and pectorals yellowish.

This species differ from *A. grunniens*, its nearest relative, by a more pointed and conical snout, a larger mouth, and a somewhat larger eye. The first anal spine is stouter, and the second spine of the same fin both stouter and longer. The even profile of the upper surface of the head contributes to a great extent in giving it its peculiar physiognomy, which, when once compared to that of *A. grunniens*, is never to be mistaken. The second dorsal is not quite so high as in the latter mentioned species, and composed of but thirty rays. The other fins exhibit no material differences in the number of their soft rays. We observe but six branchiostegal rays.

Br. VI: VI; D X, 30; A II, 8; C 3, 1, 7, 7, 1, 2; V I, 5; P 16.

In the absence of authentic specimens of *A. concinnus*, Ag., and *A. lineatus*, Ag., we are not prepared to point out the affinities of these species with the one here referred to.

Plate V, fig. 6, represents *Amblodon neglectus*, size of life; fig. 7 is the head seen from beneath; fig. 8, a scale from the dorsal region; fig. 9, a scale from the lateral line; and, fig. 10, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
636	1	Mouth of Rio Grande del Norte (Rio Bravo).	1853	Major Emory........	Alcoholic.	John H. Clark............
637	24	Matamoras (Tamaulipas)...	1853	D. N. Couch	....do....	L. Berlandier ....

UMBRINA PHALAENA, Grd.

Plate V, Figs. 1—5.

Spec. Char.—Head contained a little less than four times in the total length, pre-opercular spines inconspicuous. Posterior extremity of maxillary corresponding to a vertical line drawn across the anterior rim of the pupil. Outer row of pre-maxillar teeth very conspicuous. Longitudinal diameter of the eye entering six times and a half in the length of the side of the head: twice in advance of the anterior rim of the orbit. Origin of ventral fins opposite the third dorsal spine. Origin of anal situated under the eighth articulated ray of the second dorsal. Caudal fin slightly concave posteriorly, constituting about the sixth of the total length.

The last anal ray being bifurcated from its very base, otherwise there would be but seven soft rays to that fin. The scales are much deeper than long, finely pectinated upon their posterior section, and exhibiting radiating furrows upon their anterior section alone.

Br. VII: VII; D X, I, 23; A I, 8; C 4, 1, 8, 7, 1, 3; V I, 5; P 1, 21.

Upper regions greyish brown, obscurely clouded; inferior regions of a dirty white hue, with minute black specks. Fins olivaceous; pectorals, anal, and caudal speckled; dorsals and ventrals unicolor, except the first dorsal, which is blackish upon its upper margin.

Plate V, fig. 1, represents *Umbrina phalaena*, size of life; fig. 2 is the head viewed from beneath, showing the outline of the mouth; fig. 3, a scale from the dorsal region; fig. 4, a scale from the lateral line; and fig. 5, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
619	1	Adult.	Indianola, Texas........	1851	Col. J. D. Graham ..	Alcoholic.	John H. Clark..........
620	4	Young	Brazos Santiago	1853	G. Würdemann	....do....	G. Würdemann ....

MICROPOGON UNDULATUS, Cuv. & Val.

Grunter and Croaker.

Plate VII.

Spec. Char.—The greatest depth under the first dorsal fin is a little less than the fourth of the total length, in which the head enters three and three-quarters of a time. The posterior extremity of the maxillary is even with a vertical line drawn in advance of the pupil. The eye is sub-elliptical; its longitudinal diameter entering about five times in the length of the side of the head. The caudal fin constitutes the fifth of the total length, in which the base of the anal enters twelve times. The base of the first dorsal is a little more than the half of that of the second dorsal.

Syn.—*Perca undulata*, Linn. Syst. Nat. I, 483; &, ed. XIII*a*, *Gmelini*, I, iii, 1788, 1312.

Micropogon undulatus, Cuv. & Val. Hist. nat. Poiss. V, 1830, 219.—DeKay, New Y. Fauna IV, 1842, 84.—Storer, Synops. 1846, 73.—Holbr. Ichth. of South Ca. 1855, 145; pl. xxi, fig. 1.

A vertical line dropped from the origin of the first dorsal intersects the posterior edge of the opercle, and hence passes in advance of the base of the pectoral fins. The latter are more elongated than the ventrals.

Br. VII: VII; D X, I, 29; A II, 8; C 5, 1 8, 7, 1, 4; V I, 5; P 17.

The ground color is silvery, greyish along the dorsal region, with oblique blackish bands extending somewhat beyond the lateral line, whilst the sides of the head, the remaining portion of the flanks and the belly, are of a brilliant lustre. The second dorsal exhibits one or two longitudinal series of dark spots between the rays. The dorsal bands themselves are the result of series of spots.

Plate VII, fig. 1, represents *Micropogon undulatus*, size of life; fig. 2, the head from beneath to show the mouth; fig. 3 is a scale from the dorsal region; fig. 4, a scale from the lateral line; and fig. 5, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
626	1	Adult.	Mouth of Rio Grande el Norte (Rio Bravo).	1853	Major Emory.....	Alcoholic.	Jno. H. Clark....
627	1	......	Indianola, Texas......................	1854	......do..........	....do....	Dr. C.B.Kennerly
628	1	......	Galveston, Texas......................	1853	Lieut. Whipple...	....do....	......do..........
629	1	......	St. Joseph's Island, Texas.............	1853	G. Würdemann...	....do....	G. Würdemann...

JOHNIUS OCELLATUS, Grd.

Spotted Bass.

Plate VIII, Figs. 1—4.

Spec. Char.—The head constitutes about the fourth of the length, in which the caudal fin itself enters nearly six times. The greatest depth, under the anterior margin of the first dorsal fin, is contained four times and a half in the length. The mouth is large; its gape nearly horizontal; the posterior extremity of the maxillary extending to a vertical line drawn across the posterior rim of the orbit. The eye is sub-circular; its horizontal diameter entering six times and a half in the length of the side of the head. A vertical line dropped from the origin of the first dorsal passes immediately behind the base of the pectorals and intersects the base of the first soft ray of the ventrals.

Syn.—*Perca ocellata*, Linn. Syst. Nat. I, 483; &, ed. XIII*a*, I, iii, 1788, 1313.—Shaw, Gen. Zool. IV, 1800, 550.

Sciaena imberbis, Mitch. in Trans. Lit. and Philos. Soc. New Y. I, 1815, 411.

Corvina ocellata, Cuv. & Val. Hist. nat. Poiss. V, 1830, 134; pl. cviii.—DeKay, N. Y. Fauna IV, 1842, 75; pl. xxi, fig. 6.—Storer, Synops. 1846, 67.—Holbr. Ichth. of South Ca. 1855, 149; pl. xxi, fig. 2.

The pectorals are nearly equal to the ventrals in length. The base of the anal fin is contained about eleven times in the total length; its exterior margin is slightly concave. The base of the second dorsal is twice that of the first.

Br. VII: VII; D X, I, 25; A II, 8; C 3, 1, 8, 7, 1, 2; V I, 5; P 17.

The color is silvery; the dorsal region bluish or greyish; the lower part of the flanks and abdomen lighter; a jet black spot at the base of the upper lobe of the caudal fin.

Plate VIII, fig. 1, represents *Johnius ocellatus*, somewhat reduced in size; fig. 2 is a scale from the dorsal region; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
622	1	Adult..	Indianola, Texas............	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark........
623	5	Young.	........do.................	1853	Lt. A. W. Whipple...	....do....	Dr. C. B. Kennerly....

ORTHOPRISTIS, Girard.

Gen. Char.—The mouth is small; the upper and lower jaws are provided with small, conical teeth. The edge of the preopercle is nearly straight and finely serrated. The spinous portion of the dorsal is continuous with the soft portion, constituting one uninterrupted fin. Three small spiny rays at the anterior margin of the anal, increasing in size from the first to the third.

The natural affinities of this genus are between *Haemulon* and *Pristipoma.*

ORTHOPRISTIS DUPLEX, Grd.

PLATE IX, FIGS. 1—4.

Spec. Char.—Body somewhat elongated, sub-fusiform in its outline. Head constituting the fourth of the total length; snout sub-conical; mouth small and slightly protractile, with its gape somewhat oblique; posterior extremity of maxillary even with a vertical line drawn immediately in advance of the anterior nasal aperture. The eye is sub-elliptical, of medium size; its horizontal diameter entering about four times and a half in the length of the side of the head. The spines at the edge of the preopercle are very small, short, and acute. The origin of the dorsal fin is situated opposite the branchial apertures, hence in advance of the base of the pectorals; its posterior rays extending somewhat further backwards than those of the anal, without, however, reaching the insertion of the caudal fin. The extremities of the pectorals extend nearly as far as the tips of the ventrals, which barely reach the vent.

The scales are deeper than long; their posterior section is conspicuously pectinated, whilst the anterior section exhibits the usual radiating furrows; the lines of growth being concentrical. The base of the caudal, pectoral, and ventral fins is covered with small scales.

Br. VII: VII; D XII, 16; A III, 13; C 4, 1, 8, 7, 1, 3; V I, 5; P 18.

The dorsal region is purplish brown, the abdominal region yellowish. Oblique dark streaks follow the rows of scales above the lateral line, and longitudinal ones upon the middle of the abdomen beneath the same lateral line. This two-fold system of lines having suggested the specific name.

Plate IX, fig. 1, represents *Orthopristis duplex*, size of life; fig. 2, is a scale from the dorsal region; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
724	2	Adult..	Indianola, Texas............	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark........
725	4	Young.	Brazos Santiago, Texas......	1853	G. Würdemann.......	....do....	G. Würdemann......

Family SPARIDAE.

The fishes of this family have, as common characters, a body ovate in profile, sometimes rather deep, at others somewhat elongated, always covered by well developed scales, generally ctenoid in structure. The spinous portion of their dorsal fin is continuous with the soft portion, constituting one undivided and scaleless fin; the ventrals being inserted under the pectorals or somewhat posteriorly.

The mouth is not protractile and the palate always toothless. The maxillar teeth present themselves under various aspects characteristic of the genera. The opercular apparatus is perfectly smooth, the free edges of its bones being without either spines or denticulations. The branchial apertures are wide and continuous under the throat; the branchiostegal rays being five or six in number on either side.

LAGODON RHOMBOIDES, Holbr.

Plate IX, Figs. 13—16.

Spec. Char.—Body rather short and deep; greatest depth across the thoracic region equal to the third of the entire length. Head very declivous anteriorly and forming about the fourth of the total length; the snout being sub-conical, the mouth somewhat protractile, and when in its retracted state, the gape is horizontal. The posterior extremity of the maxillary reaches a vertical line drawn immediately behind the posterior nasal aperture. The snout is sub-conical and thickish, and the supraocular region depressed. The eye is well developed, sub-circular in shape; its horizontal diameter entering about three times and a half in the length of the side of the head. A vertical line dropped from the origin of the dorsal fin would pass between the gill opening and the base of the pectoral. The posterior extremity of the dorsal is even with that of the anal and does not quite reach the insertion of the caudal. The pectorals are elongated, their extremity extending beyond the origin of the anal, which is hardly reached by the tips of the ventrals.

Syn.—*Sparus rhomboides*, Linn. Syst. nat. ed. XII*a*, 1766, 170.—Shaw, Gen. Zool. IV, 1800, 447.
Sargus rhomboides, Cuv. & Val. Hist. nat. Poiss. VI, 1830, 68, pl. 143.—DeKay, N. Y. Fauna IV, 1842, 93, pl. lxxi, fig. 228 —Storer, Synops. 1846, 81.
Lagodon rhomboides, Holbr. South. Ichthyol. 1855, 56, pl. viii, fig. 1.

The scales above the lateral line are deeper than long, and beneath it, longer than deep; the lines of growth are sub-concentric, the pectinations inconspicuously develvoped; the radiating furrows existing upon the anterior section only.

Br. VI: VI; D XII, 11; A III, 11; C 5, 1, 8, 7, 1, 6; V I, 5; P 1, 16.

The dorsal region is light reddish brown, with a bluish metallic reflect, whilst the sides and abdomen are silvery. Seven distinct transverse narrow blackish bands may be observed along the back, tapering towards the belly. The first of these fasciae is occipital, the second subthoracic, and the seventh being caudal. Indistinct intervening fasciae may be observed in young specimens. In all, young and adult, there exists a round dark spot at the intersection of the second fascia with the lateral line.

Plate IX, fig. 13, represents *Lagodon rhomboides*, size of life; fig. 14 is a scale from the dorsal region; fig. 15, a scale from the lateral line; and, fig. 16, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
731	6	Adult.	Brazos	1853	Major Emory	Alcoholic	John H. Clark
732	6	......	Indianola, Texas	1851	Col. J. D. Graham.	do	do
733	3	......	St. Joseph's Island, Texas	1853	G. Würdemann	do	G. Würdemann
734	5	......	Brazos Santiago	1853	do	do	do
735	2	Young	Indianola, Texas	1854	Major Emory	do	Dr. C. B. Kennerly
736	6	do	do	1851	Col. J. D. Graham.	do	John H. Clark

Family MAENIDAE.

In their general aspect the representatives of this family resemble the *Sparidae* to a very great extent: the spinous portion of the dorsal fin is either continuous with the soft portion, else more or less separated from it. The insertion of the ventrals being placed under the base of the pectorals or somewhat posteriorly to it, and the caudal fin more or less emarginated or furcated. The essential differences consisting in the protractility of the mouth, and the presence upon the jaws of velvet-like teeth, and occasionally of a few canines. Similar velvet-like teeth may be observed: sometimes on the vomer, at others, on the palatine bones; else the palate is perfectly smooth or toothless. The edge of the preopercle is serrated in some and entire in others.

EUCINOSTOMUS, B. & G.

Gen. Char.—Mouth small and very protractile, which, when protruded, presents a sub-conico-tubular appearance; lips thin; maxillar teeth; palate and tongue toothless; opercular apparatus without either spines or serratures. Gill apertures continuous under the throat. First dorsal fin contiguous to the second at the base; outline between the two depressed. Caudal fin furcated. Three spiny rays at the anterior margin of the anal. Scales well developed.

Syn.—*Eucinostomus*, B. & G. in Ninth Ann. Rep. Smiths. Instit. (1854) 1855, 334.

The second spine, in both the dorsal and anal fins, is much less developed than in *Gerres*, to which genus the present one bears close affinities. The same remark applies to the spine of the ventral fins. Another distinctive trait between *Gerres* and *Eucinostomus* consists in the former having the edge of the preopercle serrated, whilst it is perfectly smooth in the latter.

EUCINOSTOMUS ARGENTEUS, B. & G.

Plate IX, Figs. 9—12.

Spec. Char.—The body is rather short and deep, the greatest depth at the thoracic region being a little more than the third of the total length. The head, which is sub-pyramidal, constitutes about the fourth of the total length; the mouth, when retracted, exhibits a horizontal gape, and then the posterior extremity of the maxillary extends to a vertical line drawn inwardly to the anterior rim of the orbit. The eye is large and circular; its diameter being contained but three times in the length of the side of the head. The nostrils are situated towards the upper surface of the snout and nearer the orbit than the extremity of the jaws. The base of the spinous portion of the dorsal fin is somewhat shorter than that of the soft portion of the same fin. The posterior extremity of the dorsal is nearly even with that of the anal. The pectorals are longer and more slender than the ventrals.

Syn.—*Eucinostomus argenteus*, B. & G. in Ninth Ann. Rep. Smiths. Instit. (1854) 1855, 335.

The scales are deeper than long, anteriorly truncated, and rounded upon the remaining three margins. Radiating furrows may be observed upon the anterior section of the scale, and the lines of growth, instead of being concentrical or sub-concentrical, are absolutely vertical. The posterior section is cellular, and the pectinations, if they exist at all, must be exceedingly minute, for we have not detected them.

Br. IV: IV; D IX, 10; A III, 8; C 5, 1, 8, 8, 1 4; V I, 5; P 13.

The ground color is silvery; the dorsal region being of a light reddish brown, with a darker spot upon the centre of the scales. A black spot at the summit of the spinous dorsal. Transverse, blackish bands or fasciae may be observed in very young specimens.

Plate IX, fig. 9, represents *Eucinostomus argenteus*, size of life. Fig. 10, is a scale from the dorsal region; fig. 11, a scale from the lateral line; and fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
720	10	Adult.	Brazos Santiago, Texas	1853	G. Würdemann ..	Alcoholic ..	G. Würdemann ..
721	18	Young	Brazos, Texas	1853	Major Emory.....	....do......	John H. Clark ...
722	2	..do..	Indianola, Texas	1853	......do..........	....do......	Dr. C.B.Kennerly.
723	10	..do..	St. Joseph's Island, Texas.....	1853	G. Würdemann ..	....do......	G. Würdemann ..

NEOMAENIS, Girard.

Gen. Char —Mouth large, not very protractile. Jaws equal ; velvet-like teeth along the middle and front of the vomer, along the palatines and jaws ; the latter exhibiting an exterior row of larger, acute, and conical ones ; whilst two canine-like, still larger, exist at the extremity of the upper jaw. Tongue smooth and toothless. Edge of preopercle finely serrated. Gill apertures continuous under the throat ; branchial rays seven. One continuous dorsal fin. Caudal fin posteriorly sub-truncated or sub-emarginated. Three spiny rays at the anterior margin of the anal.

NEOMAENIS EMARGINATUS, Grd.

Plate IX, Figs. 5—8.

Spec. Char.—Body moderately elongated, compressed, sub-fusiform in a profile view. Head sub-conical, contained three times and a half in the total length. Posterior extremity of the maxillary extending to a vertical line drawn somewhat inwardly to the anterior rim of the orbit. Eye sub-circular ; its longitudinal diameter entering about four times in the length of the side of the head : the rostral distance in advance of the eye being somewhat more than one of its diameter. External soft ray of ventrals prolonged into a membranous thread stretching beyond the posterior margin of these fins, although not reaching the origin of the anal, when bent in that direction. The caudal fin, which constitutes about the fifth of the entire length, is posteriorly sub-concave. The origin of the dorsal is placed opposite the base of the pectorals, the spinous portions being longer than the soft. The origin of the anal is situated posteriorly to the anterior soft rays of the dorsal. Ventrals inserted behind the base of the pectorals.

Syn.—*Lobotes emarginatus*, B. & G. in Ninth Ann. Rep. Smiths. Instit. (1854) 1855, 332.

The scales are well developed, somewhat deeper than long, except in the lateral line, where they are also considerably smaller and posteriorly tapering ; radiating furrows may be observed upon their anterior section alone, their posterior section exhibiting fine pectinations.

Br. VII : VII ; D X, 14 ; A III, 8 ; C 5, 1, 8, 7, 1, 6 ; V I, 5 ; P 1, 15.

The ground color is greenish olive with oblique, sometimes, undulating series of purplish brown spots, one of which on each scale, extending likewise over the vertical fins and occasionally confluent, constituting continuous narrow bands. The throat and abdomen are rather yellowish and unicolor.

Plate IX, fig. 5, represents *Neomaenis emarginatus*, size of life ; fig. 6 is a scale from the dorsal region ; fig. 7, a scale from the lateral line ; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
719	1	Brazos Santiago, Texas..........	1853	G. Würdemann......	Alcoholic.	G. Würdemann.......
738	1	Mouth of Rio Grande del Norte.	1853	Major Emory..........	....do....	Jno. H. Clark.........

Family POLYNEMIDAE.

POLYNEMUS OCTONEMUS, Grd.

PLATE X, FIGS. 5—9.

SPEC. CHAR.—The head enters about four times and a half in the total length, the snout being sub-conical, the mouth rather large and wide, the posterior extremity of the maxillary extending to a vertical line drawn considerably behind the orbit. The eye is large and sub-circular; its horizontal diameter being contained about four times in the length of the side of the head. The edge of the preopercle is finely serrated, the lower spine, situated near the convexity of the limb of that bone, is much larger than the rest. The thoracic filaments are eight in number, the tip of the longest ones extending beyond the origin of the anal fin. The posterior extremity of the ventrals barely reach the vent and extend somewhat further backwards than the extremity of the pectorals.

The scales are deeper than long, pectinated upon their posterior section and furrowed upon the anterior section. The lateral line, from the scapular region, takes a direct course towards the middle of the caudal fin. The accompanying figure will give an accurate idea of the form and relative position of the fins:

Br. VII : VII ; D VIII, I, 12 ; A III, 13 ; C 6, 1, 8, 7, 1, 5; V I, 5; P 15.

Plate X, fig. 5, represents *Polynemus octonemus* size of life ; fig. 6 is a magnified view of the head in order to show more particularly the denticulations of the limb of the preopercle ; fig. 7 is a dorsal scale ; fig. 8, a scale from the lateral line ; and fig. 9, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig'l No.	Nature of specimens	Collected by—
739	8	Adult.	Brazos Santiago, Texas..	1853	G. Würdemann......	......	Alcoholic.	G. Würdemann.......
762	2	Young	Galveston, Texas.......	1853	Lt. A. W. Whipple...	3	....do....	Dr.C.B.Kennerly....

Family ATHERINIDAE.

Two species of this family may be recognized in the collections under examination, one from the fresh waters of the interior of Mexico, specimens of which were collected by Major Rich and Jno. Potts, esq., the other from the salt and brackish waters of Indianola, St. Joseph's island, Brazos, and the mouth of the Rio Grande del Norte (Rio Bravo), the specimens having been collected by Jno. H. Clark, under Col. J. D. Graham and Major Emory, and by Mr. Gustavus Würdemann, of the United States coast survey. Both of the above species belong to the genus *Atherinopsis*, and will be described on a future occasion.

Family MUGILIDAE.

The body is sub-cylindrical, owing to the thickness of the dorsal region. The scales generally are large, ctenoid in structure, and cover likewise the upper surface of the head. There is no lateral line properly so to be called, every scale being provided with a mucous hole. The dorsal fins are widely apart ; the ventrals, almost abdominal, are situated on a vertical line drawn between the pectorals and the anterior dorsal. The teeth are exiguous, and sometimes even wanting. The maxillar bones are small and almost buried in the thickened lip which covers the premaxillaries. The sub-orbitar bone is often contiguous to that lip, when the mouth is closed, concealing entirely under its edge the maxillary.

MUGIL BERLANDIERI, Grd.

Plate X, Figs. 1—4.

Spec. Char.—The head enters about four times and a half in the total length, in which the greatest depth is contained five times or a little more. The caudal fin is equal to the head in length. The lower jaw is a little shorter than the upper; the teeth are exceedingly small, scarcely perceptible upon the dentaries (lower jaw); they are more apparent upon the outer premaxillar row, although those placed in the rear are not more developed than those of the lower jaw. A patch of asperities is felt upon the palatines; the vomer is smooth and preceded anteriorly by a wide transverse groove, such as may be observed in several other species; similar asperities exist at the sides of the base of the tongue. The edge of the preorbitar bone, under which the maxillary is concealed when the mouth is closed and retracted, is denticulated posteriorly.

The anterior third of the dorsal and anal, the base of the pectorals, and the caudal almost entirely, are protected with small scales. The formula of the fins reads thus:

D IV, I, 8; A III, 9; C 3, 1, 6, 6, 1, 3; V I, 5; P 16.

The scales of the body are well developed, deeper than long, finely pectinated posteriorly and exhibiting diverging furrows upon their anterior section alone; the mucous aperture is elongated and placed almost exclusively upon the posterior section. Fourteen longitudinal series may be counted from the base of the first dorsal fin to the mesial line of the abdomen in advance of the vent. In a longitudinal series from the branchial aperture to the insertion of the caudal there are from forty to forty-two scales.

The upper surface of the head and the dorsal region exhibit a greyish tint, whilst the flanks are silvery, and the sides of the head and the abdomen pervaded with a yellowish or golden reflect; longitudinal greyish lines, more or less conspicuous, may be traced along the series of scales. The fins are uniform light yellow or olive, the base of the pectorals alone being blackish.

Plate X, fig. 1, represents *Mugil berlandieri*, size of life, it being one of the largest specimens observed; fig. 2 is a scale from the dorsal region; and fig. 3, a scale from the abdominal region; fig. 4 exhibits a young specimen caught in the same net and supposed to belong to the same species.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig'l No.	Nature of specimens.	Collected by—
763	4	A.&Y	St. Joseph's Island, Tex.	1853	G. Würdemann......	......	Alcoholic.	G. Würdemann......
764	12	..do..	Indianola, Tex.........	1851	Col. J. D. Graham....	......	....do....	Jno. H. Clark........
765	5	..do..	Brazos Santiago, Tex....	1853	G. Würdemann......	......	....do....	G. Würdemann......
766	8	Young	Brazos................	1853	Major Emory.........	......	....do....	Jno. H. Clark........
767	12	..do..	Galveston, Tex.........	1853	Lt. A. W. Whipple...	3	....do....	Dr. C. B. Kennerly....

Family SCOMBRIDAE.

This family, as it stands in the systematic writers, includes a long series of genera most diversified in shape and in structure. None needs a more thorough anatomical investigation in order to enable us to define it as a group, if a natural group it proves to be. We cannot help thinking that characters will be detected by the aid of which the various groups already delineated by superficial traits may be erected into as many natural families.

CHORINEMUS, Cuv. & Val.

The limits of this genus are anything but well defined, and not having at our command the proper materials towards a revision of its characters, we are compelled to record the following species under its heading. Some attention ought to be paid to the dentition of the various species in order to ascertain whether better groups could not be formed, based chiefly upon that character.

CHORINEMUS LANCEOLATUS, Grd.

PLATE XI, FIG. 5.

SPEC. CHAR.—Body elongated, very much compresssed and quite tapering from the origin of the second dorsal and anal to the peduncle of the tail. Head constituting about the fifth of the total length; snout elongated and sub-conical; gape of the mouth oblique; jaws sub-equal, lower one longest; posterior extremity of the maxillary extending to a vertical line drawn midway between the pupil and the posterior rim of the orbit. Patches of slender and acute teeth on the vomer, palatines, and tongue; a double row of them on either jaws. Eye well developed and circular; its diameter entering three times and a half in the length of the side of the head: exactly once in advance of its anterior rim. Pectorals and ventrals of moderate development; ventrals inserted opposite the base of the pectorals.

The surface of the body presents the aspect of minute longitudinal wrinkles into which small, elongated scales are imbedded. The lateral line, from the scapular region slightly ascends to nearly opposite the origin of the first dorsal fin, hence descending in slight undulations until on the middle of the flank, then straight to the base of the caudal fin.

Br. VIII: VIII; D V, 21; A II, 21; C 8, 1, 8, 8, 1, 8; V 6; P 1, 15.

The dorsal region is bluish; the sides of the head and body being silvery, and the fins unicolor.

Plate XI, fig. 5, represents *Chorinemus lanceolatus*, size of life. It is proper to remark that the interradial membrane in the second dorsal and anal fins is much less developed than represented on the figure, thus giving the rays a greater freeness.

List of specimens.

Catal. No.	No. of Spec	Age.	Locality.	When collected.	Whence obtained.	Nature of Specimen.	Collected by—
710	1	....	St. Joseph's Island, Texas...	1853	G. Würdemann	Alcoholic.	G. Würdemann ......

CHLOROSCOMBRUS. Girard.

GEN. CHAR.—Elongated and narrow patches of velvet-like teeth on the jaws, vomer, and palatine bones; tongue smooth; mouth rather small and slightly protractile, its gape being oblique and the tip of the lower jaw projecting in front of the upper; body rather short and deep, scaly; lateral line unarmed, that is, not shielded; pectoral fins falciform; two small spines in advance of the anal fin. Ventrals very small. A small horizontal spine, directed forwards, in advance of the first dorsal.

Were it not for the unarmed lateral line, the species upon which the present genus is founded would readily be taken for a *Caranx*.

To this genus belongs *Seriola cosmopolita*, CUV. & VAL. and which is closely allied to the following one.

CHLOROSCOMBRUS CARIBBAEUS, Grd.

PLATE XI, FIG. 6.

SPEC. CHAR.—Body deep and rather short, very much compressed, with the ventral outline more convex than the back, which on a profile view constitutes a very depressed curve. Peduncle of tail exiguous; caudal fin deeply furcated. Head forming a little more than the fifth of the length. The snout is short, slightly protractile; the mouth being rather small, its gape very oblique, and the lower jaw projecting somewhat beyond the upper. The posterior extremity of the maxillary extends to a vertical line drawn across the anterior rim of the orbit. The eye is well developed, sub-circular, its diameter ente ing about three times in the length of the side of the head. Pectorals well developed and falciform; ventrals very small, inserted upon a vertical line drawn immediately behind the base of the pectorals.

The body is covered with small and inconspicuous scales, the lateral line forming anteriorly an arc of a circle, being straight along the flank to the base of the caudal, where it is provided with more conspicuous scales.

Br. VII: VII; D VIII; 29; A II, 29; C 6; 1, 7, 7, 1, 6; V 6; P 1, 16.

The color of the dorsal region is purplish blue, a tint probably altered by the alcohol; the sides of the head and flanks being silvery. A black spot may be observed upon the peduncle of the tail near the insertion of the caudal fin. The fins themselves are of a uniform light olive.

Plate XI, fig. 6, represents *Chloroscombrus caribbaeus*, size of life.

List of specimens.

Catal. No.	No. of Spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of Specimen.	Collected by—
714	3	....	St. Joseph's Island, Texas...	1853	G. Würdemann......	Alcoholic.	G. Würdemann......

DOLIODON, Girard.

Gen. Char.—Head small; snout bluntly rounded with the mouth situated beneath it. Mouth small; velvet-like teeth upon the jaws and front of the vomer; none on the palatines and tongue. Body rather short, minutely scaly; lateral line unarmed. Dorsal and anal spines united together by a membrane and contiguous to the soft and articulated portion of these fins.

We are at a loss to account for the fact of Dr. Holbrook identifying the species upon which this genus is founded, with *Trachinotus pampanus*, Cuv. & Val., and which is the type of his genus *Bothrolaemus*, characterized by the total absence of teeth.

The *Zeus spinosus* of Mitchill belongs to this genus of which it will constitute the second species.

DOLIODON CAROLINUS, Grd.

Plate XI, Fig. 4.

Spec. Char.—Body sub-illipsoid, rather short, deep, compressed. Head contained four times and a half in the total length. Snout thick, blunt, and rounded. Mouth moderate, slightly protractile, placed beneath the snout, with its gape nearly horizontal, the upper jaw alone forming a slight arch over the lower one, which is the shortest. The posterior extremity of the maxillary extending to a vertical line drawn across the posterior rim of the pupil. The eye is well developed and circular; its diameter entering about three times and a half in the length of the side of the head. Pectorals and ventrals of moderate development; ventrals somewhat smaller than the pectorals, and inserted upon a vertical line drawn posteriorly to the base of the latter.

Syn.—*Lichia carolina*, DeKay, N. Y. Fauna, IV, 1842, 114, pl. x, fig. 3.—Storer, Synops. 1846, 96.—Bd. in Ninth Ann. Rep. Smiths. Instit. (1854) 1855, 345.

The scales are very minute, inconspicuous; the lateral line, slightly arched upon its anterior half, is nearly straight posteriorly, undergoing slight undulations.

Br. V: V; D VII, 24; A III, 22; C 7, 1, 8, 8, 1, 6; V I, 5; P 1, 18.

The upper regions are bluish purple; the inferior regions appearing as though washed with gold and silver. The upper portion of the second dorsal is blackish; the rest of the fins being light olive.

Plate XI, fig. 4, represents a small specimen of *Doliodon carolinus*, size of life.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
713	5	St. Joseph's Island, Texas	1853	G. Würdemann ..	Alcoholic ..	G. Würdemann ..

CARANGUS, Girard.

Gen. Char.—Narrow patches of velvet-like teeth on the palatines, front of vomer, and upper jaw, which is, moreover, provided with an external row of small ones of a conical and acerated form. The lower jaw having but one row of the latter kind. Profile of the head more or less rounded or convex. A small horizontal spine directed forwards in advance of the first dorsal. Two spines in advance of the anal. Pectoral fins elongated and falciform. Lateral line shielded along the flank and peduncle of the tail.

To this genus we can already refer with certainty *Caranx chrysos*, Cuv. & Val.; *Caranx fallax*, Cuv. & Val.; *Caranx pisquetus*, Cuv. & Val.; *Caranx bartholomaei*, Cuv. & Val.; *Caranx defensor*, DeKay; *Caranx falcatus*, Holbr.; and, *Caranx richardi*, Holbr.

CARANGUS ESCULENTUS, Grd.

Plate XI, Figs. 1—3.

Spec. Char.—Body compressed; greatest depth contained three times in the total length, in which the head enters four times. Caudal deeply furcated, either lobe being equal to the head in length. The diameter of the eye is contained four times in the length of the side of the head. The gape of the mouth is slightly oblique, the posterior extremity of the maxillary corresponding to a vertical line intersecting the posterior rim of the pupil. Two canine teeth, larger than the rest, near the symphysis of the lower jaw: one on either side. Lateral line curved from its origin to opposite the fifth or sixth ray of the second dorsal, hence straight and shielded to the base of the caudal. Scales small and inconspicuous in young specimens.

Syn.—*Scomber carangus*, Bloch.—Shaw, Gen. Zool. IV, 1800, 599.
Caranx carangus, Cuv. & Val. Hist. nat. Poiss. IX, 1833, 91.—Storer, Synops. 1846, 101.

The general coloration is silvery, with a lead or violet tint along the upper surface of the head and dorsal region. A black spot upon the edge of the opercle; a bluish patch at the posterior edge of the elevated portion of the second dorsal fin, and a brownish filet along the edge of the caudal. The fins otherwise are yellowish. The young exhibit dark vertical bands (figs. 2 and 3). These bands are sometimes still present on specimens of the size of fig. 1.

Plate XI, fig, 1—3, represents three stages in the growth of *Carangus esculentus*, which is said to attain occasionally a weight of twenty-five pounds.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
708	12	......	Brazos Santiago, Texas........	1853	G. Würdemann	Alcoholic.	G. Würdemann.....
709	1	Young	Mouth of Rio Grande del Norte (Rio Bravo).	1853	Major Emory	....do....	John H. Clark......
715	3	......	Brazos Santiago, Texas.......	1853	G. Würdemann	....do....	G. Würdemann.....

ARGYREIOSUS CAPILLARIS, DeKay.

Plate XI, Fig. 7.

Spec. Char.—The greatest depth taken obliquely between the origin of the second dorsal and the insertion of the ventrals is equal to the length measured from the extremity of the snout to the origin of the caudal peduncle. The snout itself is slightly protruding, and the profile of the head steeper than in *A. vomer*. The outline of the occipital region constitutes an arc of a circle rather than a plane. The peduncle of the tail is somewhat inclined downwards. Anterior two rays of the dorsal fin prolonged into long filaments.

Syn.—*Zeus capillaris*, Mitch. (non Bloch) in Trans. Lit. & Philos. Soc. N. Y. I, 1815, 383; pl. ii, fig. 2.
Argyreiosus capillaris, DeKay, N. Y. Fauna, IV, 1842, 125; pl. xxvii, fig. 82.—Storer, Synops. 1846, 104.—Bd. in Rep. Smiths. Inst. IX, (1854) 1855, 337.

The color is of a brilliant silvery lustre; the dorsal and ventral filament being blackish.

Plate XI, fig. 7, represents *Argyreiosus capillaris*, size of life, although not fully grown.

List of specimens.

Catal. number.	No. of spec.	Locality.	Whence obtained.	Nature of specimen.	Collected by—
712	2	Matamoras, Mexico........	D. N. Couch	Alcoholic ..	L. Berlandier...............

VOMER SETAPINNIS, Grd.

PLATE XI, FIG. 8.

SPEC. CHAR.—Greatest depth somewhat more than the half of the total length in all the specimens now before us, the largest of which we have caused to be figured. The rule appears to be that the depth is less than the half of the length, the body being proportionally more elongated than represented in the accompanying figure.

SYN.—*Zeus setapinnis*, MITCH. in Trans. Lit. & Philos. Soc. N. Y. I, 384, pl. I, fig. 9.
Vomer brownii, CUV. & VAL. Hist. nat. Poiss. IX, 1833, 189; pl. cclvi.—DEKAY, N. Y. Fauna, IV, 1842, 127; pl. xxv, fig. 78.—STORER, Synops. 1846, 105.

The color is of a brilliant silvery tint, somewhat greyish along the dorsal region, especially in full grown specimens. The second dorsal being minutely black dotted, and the pectorals olivaceous.

Plate XI, fig. 8, represents, size of life, *Vomer setapinnis*, not quite fully grown.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
711	5	Brazos Santiago, Texas .	1853	G. Würdemann	Alcoholic ...	G. Würdemann ....

Family TAENIOIDAE.

We are indebted to G. Würdemann for two specimens of *Trichiurus lepturus*, Linn., collected, one at St. Joseph's Island, the other at Brazos Santiago, along the Texan shore of the Gulf of Mexico.

Family GOBIDAE.

GOBIONELLUS, Girard.

It is our design to place in this genus such species of Gobioids, the body of which is generally elongated, and always protected with scales; having likewise two dorsal fins, an anal nearly as long as the second dorsal, and an elongated and pointed caudal fin.

Under this appellation will come *Gobius lanceolatus*, *G. bacalaus*, and *G. smaragdus*, all three inhabitants of the Caribbean sea; and, finally, *G. brasiliensis* also.

GOBIONELLUS HASTATUS, Grd.

PLATE XII, FIGS. 7 and 8.

SPEC. CHAR.—Head contained about seven times in the total length. Snout anteriorly rounded; jaws sub-equal; gape of the mouth oblique; posterior extremity of maxillary extending to a vertical line drawn back of the pupil. Branchial isthmus rather wide. First dorsal fin somewhat lower than the second. Caudal lanceolated. Anal fin as long as the second dorsal, and almost evenly opposed to it. Ventrals not reaching the vent. Pectorals extending as far back as the ventrals.

Scales well developed, as deep as long. Color reddish brown, lighter beneath than above; fins unicolor.

D VII, 14; A 15; C 3, 9, 8, 3; V 5; P 14.

Plate XII, fig. 7, represents *Gobionellus hastatus*, size of life. Fig. 8 is one of its scales magnified.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
645	1	Adult.	St. Joseph's Island, Tex.....	1854	G. Würdemann...	Alcoholic..	G. Würdemann...

1. GOBIUS LYRICUS, Grd.

PLATE XII, FIGS. 4 and 5.

SPEC. CHAR.—Body compressed, fusiform in profile. Head anteriorly rounded, contained five times and a half in the total length. Jaws sub-equal; gape of the mouth nearly horizontal; posterior extremity of maxillary reaching a vertical line drawn through the pupil. Branchial isthmus wide. Dorsal fins not contiguous. Middle rays of first dorsal filiform and membranous at their tips, higher than the second dorsal, the posterior rays of which, as also those of the anal, reach the base of the caudal. The caudal fin itself is lanceolated, and the anal nearly as long as the second dorsal. The tips of the ventrals reach the vent. The extremities of the pectorals project further back than the ventrals.

Scales rather large, somewhat longer than deep, posteriorly sub-angular. Color reddish brown, obscurely barred with blackish brown.

D VI, 12; A 12; C 5, 8, 7, 4; V 5; P 16.

Plate XII, fig. 4, represents *Gobius lyricus*, size of life. Fig. 5 is one of its scales magnified. The dorsal fin is not correctly delineated.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
646	8	Adult & Young.	Brazos Santiago, Texas....	1854	G. Würdemann...	Alcoholic..	G. Würdemann...

2. GOBIUS WÜRDEMANNI, Grd.

OBSERV.—Resembles very much the preceding species, of which it has the general physiognomy. The head is somewhat larger, the caudal fin shorter, as well as the ventrals, and the anal not so deep.

D VI, 11; A 12; C 4, 8, 8, 3; V 5; P 16.

The scales are also smaller. The color is reddish brown, obscurely barred with blackish.

The third dorsal spine is the longest and bears a filiform membranous appendage not quite so much developed as in *G. lyricus*. The teeth are very slender, and a good deal smaller than in the latter species.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained	Nature of specimen.	Collected by—
647	1	Adult.	Brazos Santiago, Texas......	1854	G. Würdemann ..	Alcoholic ..	G. Würdemann ..

3. GOBIUS CATULUS, Grd.

PLATE XII, FIGS. 9 and 10.

SPEC. CHAR.—Body sub-fusiform. Head somewhat declivous forwards, constituting not quite the fourth of the entire length. Jaws even; gape of the mouth somewhat oblique; posterior extremity of maxillary extending to a vertical line which would intersect the pupil. Branchial isthmus very wide. Dorsal fins not contiguous; base of the second somewhat longer than that of the first. Caudal posteriorly rounded. Anal rather short and nearly as deep as the second dorsal is high; its origin being situated opposite the third or fourth ray of the latter mentioned fin and nearly even with it behind. Ventrals rather broad, not extending to the vent. Pectorals broad also and rounded; their extremities reaching a vertical line intersecting the vent.

Scales of moderate size, longer than deep, posteriorly tapering, with numerous radiating furrows. Color olivaceous brown, transversely maculated with blackish brown.

D VI, 11; A 11; C 3, 8, 8, 3; V 5; P 14.

Plate XII, fig. 9, represents *Gobius catulus*, size of life. Fig. 10 is one of its scales.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
648	2	Adult.	St. Joseph's Island, Texas...	1854	G. Würdemann ..	Alcoholic ..	G. Würdemann...

4. GOBIUS GULOSUS, Grd.

SPEC. CHAR.—The head, which has an elongated appearance, is compressed like the body, constitutes the fourth, or somewhat less, of the total length. The snout is sub-conical, the mouth large and very deeply cleft, with its gape oblique, and the lower jaw slightly longer than the upper. The posterior extremity of the maxillary extends to a vertical line drawn altogether behind the entire orbit. The eyes are rather small, situated towards the upper surface of the head; the inter-ocular space being about equal in width to the half of the ocular diameter, which enters nearly five times in the length of the side of the head. The branchial isthmus is moderately wide. The first dorsal fin is not contiguous to the second; it is also higher; two of its middle rays being filiform at their extremities; the posterior rays of the second dorsal and those of the anal barely reach the insertion of the caudal, the latter stretching a little further than the former. The posterior margin of the caudal itself is rounded. The extremity of the ventrals extends to the vent; the pectorals are longer still, rather broad and well developed.

The scales are of moderate development, deeper than long, with numerous radiating furrows upon their posterior section.

D VI, 15; A 15; C 4, 7, 7, 3; V 5; P 18.

The ground color is olivaceous brown; the dorsal region, the upper surface and upper portion of the sides of the head being maculated with black; the spots having a tendency to constitute oblique transverse bands along the dorsal region, and longitudinal ones on the sides of the head.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
797	3	Adult & Young.	Indianola, Texas....	1851	Col. J. D. Graham..	Alcoholic ..	Jno. H. Clark..

GOBIOSOMA, Girard.

There are other Gobioids, which, under an external appearance of *Gobius*, are, nevertheless, entirely deprived of scales. To include these we frame the above genus. The species which inhabit the coast of South Carolina and known under the name of *Gobius alepidotus* (*G. viridipallidus*, or *G. boscii*), belongs to this type.

GOBIOSOMA MOLESTUM, Grd.

Plate XII, Fig. 14.

Spec. Char.—Head large, depressed, superiorly flattened, constituting a little less than the fourth of the total length. Eyes small, situated near the top of the head. Snout rounded ; jaws even ; posterior extremity of the maxillary reaching a vertical line drawn in advance of the pupil. Branchial isthmus very wide. Dorsal fins contiguous at their base. Caudal posteriorly rounded. Anal shorter than the second dorsal. Ventrals quite small, not extending to the vent. Pectorals broad and well developed, extending much beyond the ventrals.

Body and head scaleless. Color dusky brown ; fins with blackish streaks.

D VII, 12 ; A 12 ; C 2, 8, 8, 2 ; V 5 ; P 16.

The soft rays of the fins are bifurcated, a structure not exhibited on the figure.

Plate XII, fig. 14, represents *Gobiosoma molestum*, size of life.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
644	1	Adult.	Indianola, Tex	1851	Col. J. D. Graham..	Alcoholic ..	John H. Clark......

Family BLENNIDAE.

BLENNIUS MULTIFILIS, Grd.

Plate XII, Fig. 6.

Spec. Char.—Head contained four times and a half in the total length. Posterior extremity of maxillary reaching a vertical line drawn through the pupil. Cutaneous flap above the eyes provided on either side and near the base with four filiform cirrhi. Spinous portion of dorsal fin lower and somewhat longer than the soft portion which is contiguous to the base of the caudal. Posterior margin of caudal fin rounded off. Origin of anal situated in advance of the anterior soft ray of the dorsal. Pectorals broad ; their extremities extending as far back as the anterior margin of the anal. Blackish brown above, reddish brown beneath ; dorsal region, dorsal and caudal fins with roundish spots, more conspicuous in the young than in the adult.

A broad isthmus separates the gill apertures under the throat. There are four canine teeth, two upper and two lower, one on either side. The lower ones are larger than the upper.

Br. V : V ; D XIII, 14 ; A II, 18 ; C 3, 1, 5, 5, 1, 3 ; V 1, 3 ; P 15.

Plate XII, fig. 6, represents *Blennius multifilis*, size of life.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
649	1	Adult.	St. Joseph's Island, Tex..	1854	Gust. Würdemann..	Alcoholic ..	G. Würdemann ....
649	17	Young.	........do..............	1854	........do.........	....do.....	........do.........

1. ELEOTRIS SUMNULENTUS, Grd.

Plate XII, Figs. 1—3.

Spec. Char.—Body sub-fusiform. Head contained about four times and a half in the total length. Snout rounded; jaws equal; gape of mouth somewhat oblique; posterior extremity of maxillary extending to a vertical line intersecting the anterior rim of the orbit. Eye circular; its diameter entering four times and a half in the length of the side of the head. Branchial isthmus narrow. Second dorsal fin higher than the first; its posterior rays, like those of the anal, being the longest, and their extremities approximating the base of the caudal when inclined in that direction. Tips of ventrals not reaching the vent. Extremities of pectorals stretching somewhat beyond the ventrals. Caudal fin of the same length as the head, and posteriorly rounded.

The scales are rather large, as deep as long; smaller on the upper surface of the head than on the body.

D VII, 9; A 10; C 4, 7, 7, 4; V 5; P 14.

Color reddish brown with interspersed light spots. A black spot above the insertion of the pectorals, and a streak from the eye to the angle of the mouth. Branchial apparatus purplish. Dorsals and anal spotted or barred. Caudal, ventrals, and pectorals greyish olive.

Plate XII, fig. 1, represents *Eleotris sumnulentus*, size of life. Fig. 2, its head from above. Fig. 3, one of its dorsal scales.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
641	1	Ad't.&Y'g.	Mouth of Rio Grande del Norte (R. Bravo)..	1854	Maj. Emory..	Alcoholic.	Jno. H. Clark.

2. ELEOTRIS GYRINUS, Cuv. & Val.

Plate XII, Figs. 11 and 12.

Observ.—The specimen figured being the only one procured by the Commission, we are not prepared to compare it fully with its congeners, and since it approximates closely the species under which name we record it, we have thought advisable to wait until more materials shall be available before any attempt is made to establish either its specific identity with, or difference from, *Eleotris gyrinus*.

List of specimens.

Catal. No.	No. of spec.	Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
642	1	♀	Mouth of Rio Grande (R. Bravo)...	1854	Maj. Emory....	Alcoholic ..	John H. Clark..

PHILIPNUS DORMITATOR, Cuv. & Val.

PLATE XII, FIG. 13.

OBSERV.—We are likewise compelled to record under the above name the small fish represented on the accompanying plate. It is the only specimen we have ever seen, and was taken from the mouth of the preceding species, caught in the act of swallowing it. We entertain the hope that at no distant period we shall have an opportunity of elucidating whatever in the history of these two fishes will now appear as though left untold

List of specimens.

Catal. No.	No of spec.	Age.	Locality.	When collected.	Whence obtained	Nature of specimen.	Collected by—
643	1	Young.	Mouth of Rio Grande (R. Bravo).....	1854	Maj. Emory ...	Alcoholic ...	John H. Clark...

Family PLEURONECTIDAE.

We recognize four different species of flat fish belonging to several genera. The specimens were procured at Indianola and Brazos by Jno. H. Clark under Col. J. D. Graham and Major Emory, and at St. Joseph's Island, by G. Würdemann.

Family ECHENEIDAE.

Two small specimens of a species of *Echeneis* were obtained at St. Joseph's Island, Texas, by Gustavus Würdemann of the United States Coast Survey.

Family OPHIDIDAE.

OPHIDION JOSEPHI, Grd.

SPEC. CHAR.—Head contained six times in the total length. The eye is moderate; its diameter is contained four times in the length of the side of the head. The posterior extremity of the maxillar bone extending to a vertical line drawn across the posterior rim of the orbit. The origin of the dorsal fin is situated at some distance behind the base of the pectorals. Ground color light olive sprinkled all over with brownish or purplish specks, except the sides of the head and the belly which are unicolor. The vertical fins being lined exteriorly with black.

Differs from *O. taylori* of the Pacific coast, by a shorter body, more elongated pectorals and a more backwards origin of both the dorsal and anal fins.

List of specimens.

Catal. No.	No. of Spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of Specimen.	Collected by—
868	2	....	St. Joseph's Island, Texas...	1853	G. Würdemann......	Alcoholic.	G. Würdemann......

Family SCOMBERESOCIDAE.

BELONE SCRUTATOR, Grd.

PLATE XIII.

SPEC. CHAR.—Lower jaw longer than the upper; head constituting about the third of the total length. Middle region of cranium depressed and covered with scales; the gill covers, the branchial apparatus, cheeks and base of lower jaw are scaly. Eye large, sub-elliptical; its longitudinal diameter entering about twelve times in the length of the side of the head, eight times in advance of the orbit, and thrice posteriorly. The anal fin is larger than the dorsal; the caudal is sub-crescentic upon its posterior margin, its lobes being sub-equal.

The anterior portion of both the dorsal and anal fins is protected with small scales. The scales which cover the body are of moderate development, longer than deep, irregularly elliptical, exhibiting distant concentric striae but no radiating furrows.

Br. XIII: XIII; D 15; A 18; C 4, 1, 7, 6, 1, 3; V 6; P 13.

The upper region is greyish olive, the sides silvery with a dark narrow band of a metallic lustre, whilst the inferior region is yellowish olive. The fins being unicolor, of a greyish or yellowish olive, also.

Plate XIII, fig. 1, represents *Belone scrutator*, size of life; fig. 2 being a dorsal scale; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of Spec.	Age.	Locality.	When collected	Whence obtained.	Nature of Specimens.	Collected by—
833	2	Adult.	Brazos, Texas..............	1853	Major Emory	Alcoholic.	John H. Clark........
834	2	Young.	St. Joseph's Island, Texas...	1853	G. Würdemann......	....do....	G. Würdemann......

Family LABRIDAE.

HERICHTHYS, B. & G.

GEN. CHAR.—Body compressed, sub-elliptical in its outline. Teeth small, sub-conical, simple, exterior row most conspicuous; lower lip entire. Branchiostegal rays five in number. Ventrals, dorsal, and anal fins acuminated; caudal rounded off posteriorly. Five or six spiny rays to the anal. Scales very large, ctenoid in structure; lateral line interrupted.

SYN.—*Herichthys*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 25.

This genus is allied to *Heros* of Heckel, from which it differs in the structure of the exterior row of maxillar teeth which are simple instead of exhibiting lateral hooks.

HERICHTHYS CYANO-GUTTATUS, B. & G.

PLATE IV, FIGS. 9—12.

SPEC. CHAR.—The head constitutes about two-sevenths of the total length. The snout is sub-conical, the frontal line depressed in advance of the eyes. Jaws even; three irregular rows of minute teeth placed immediately behind an anterior and more conspicuous row. Eyes well developed and circular; their diameter entering about four times and a half in the length of the side of the head. Posterior portion of the cheeks scaly; large scales on the opercular apparatus. Anterior margin of dorsal fin situated in advance of the insertion of the ventrals; the tip of its posterior rays projecting somewhat beyond those of the anal; both those of the anal and dorsal project beyond the base of the caudal in adult specimens. The insertion of the ventrals takes place backwards of the base of the pectorals; the exterior soft ray being much longer than the others. The caudal fin constitutes about two-ninths of the entire length.

SYN.—*Herichthys cyano-guttatus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 25.

The scales are very large, deeper than long; nineteen to twenty longitudinal series may be counted across the line of greatest depth. The lateral line is composed of twenty-six scales, eighteen being counted from the upper angle of the opercle to the interrupted portion of that line and eight more along the peduncle of the tail.

D XVI, 9 + 1; A V or VI, 6 + 1; C 2, 1, 7, 7, 1, 3; V I, 5; P 14.

The ground color is brownish, scattered all over with small bluish spots. A black blotch is sometimes observed upon the middle of the spinous portion of the dorsal, and another on the dorsal region below the former. A third black blotch is observed at the base of the caudal fin. The young exhibit transverse blackish bands or fascia, which are sometimes observed, though faintly, upon rather large specimens.

Plate IV, fig. 9, represents *Herichthys cyano-guttatus*, size of life, but not full grown; fig. 10 is a scale from the dorsal region; fig. 11, a scale from the lateral line; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens	Collected by—
850	5	Young.........	Devil's river, Texas......	1851	Col. J. D. Graham..	Alcoholic.	Jno. H. Clark....
851	14	Adult & Young.	Laguna; Fort Brown, Tex.	1853	Maj. Emory........	....do....	......do..........
852	8	.......do.......	Brownsville, Texas........	1852	Capt. Van Vliet....	....do....	Capt. Van Vliet...
853	10	.......do.......	Matamoras, Mexico.......	1853	Lt. D. N. Couch....	....do....	L. Berlandier ....
854	4	.......do.......	...........do.............	1853	........do..........	....do....	......do..........
855	6	.......do.......	San Juan river, San Diego, near Cadereita.	1853	........do..........	....do....	Lt. Couch........
856	1	Adult.........	Cadereita, Mexico.........	1853	........do..........	....do....	....do............

Family SILURIDAE.

AILURICHTHYS, B. & G.

Gen. Char.—Head depressed, smooth, unarmed; snout broad and rounded off. Two pairs of flattened barbels; a maxillar pair, sometimes very much elongated; and a mental pair, always shorter. Velvet-like teeth on the pre-maxillaries and front of the vomer. Anterior margin of both dorsal and pectoral fins prolonged into a membranous thread, more or less elongated, according to the species. An adipose dorsal fin situated opposite the anal. Caudal more or less furcated.

Syn.—*Ailurichthys*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 26.

This genus differs from *Galeichthys*, to which it is closely related, by the presence of two pairs of barbels only, instead of three. Accordingly *Galeichthys gronovii*, *G. eydouxii*, and *G. blochii*, of Cuvier and Valenciennes, must be referred to it.

AILURICHTHYS MARINUS, B. & G.

Salt water Cat-fish.

Plate XIV.

This well known and rather common species we have caused to be figured in order to supply a *desideratum*. Fig. 1, is taken from a specimen double that size; fig. 2, being an outline of the fish seen from above; and fig. 3, the head seen from beneath, exhibiting the shape of the mouth and the insertion of the mental pair of barbels.

Syn.—*Silurus marinus*, Mitch. in Trans. Lit. & Philos. Soc. N. Y. I, 1815, 433.
Galeichthys parae, Cuv. & Val. Hist. Nat. Poiss. XV, 1840, 33.
Galeichthys marinus, DeKay, N. Y. Fauna IV, 1842, 178; pl. xxxvii, fig. 118.—Stober, Synops. 1846, 149.
Ailurichthys marinus, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 26.

The dorsal region is bluish, tinged with green or olive; the flanks being silvery and the belly of an opaque white. The fins are uniform greyish olive, the adipose alone being blackish.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
835	1	Adult..	Indianola, Texas..................	1851	Col. J. D. Graham..	Alcoholic	Jno. H. Clark....

ARIUS EQUESTRIS, B. & G.

PLATE XV.

Spec. Char.—Head contained four times and three-quarters in the total length. Horizontal diameter of the eye contained five times in the length of the side of the head. Maxillary barbels extending to the middle of the length of the pectorals. Anterior margin of the dorsal fin thrice as high as its posterior margin, and equidistant between the extremity of the snout and the adipose; its superior margin being sub-concave. Adipose dorsal fin of medium size, and situated opposite the middle of the anal. The latter is deeper than long, and concave upon its outer edge. Extremities of the pectorals extending as far back as the posterior margin of the dorsal. Ventrals are nearly equidistant between the tip of the pectorals and the origin of the anal.

Syn.—*Arius equestris*, B & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 26.

The color is of a greyish argentine hue, somewhat darker along the dorsal region than on the flanks and the belly.

Br. V: V; D I, 7; A 16; C 13, 1, 7, 7, 1, 12; V 6; P I, 9.

Plate XV, fig. 1, represents *Arius equestris*, size of life; fig. 2 is an outline of the fish seen from above; fig. 3, an outline of the head seen from beneath, showing the shape of the mouth and the insertion of the mental barbels.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
836	1	Adult..	Indianola, Texas..................	1851	Col. J. D. Graham..	Alcoholic.	Jno. H. Clark....

1. PIMELODUS AFFINIS, B. & G.

PLATES XVI & XVII.

Spec. Char.—The head is contained five times and a half in the total length, in which the caudal fin enters but five times. The eye is of medium size, its diameter entering a little more than six times in the length of the side of the head. The anal is very elongated, its base being somewhat more than the fourth of the whole length, and the tips of its posterior rays extend further back than the extremity of the adipose fin, which is inserted opposite the posterior third of the one just alluded to. The extremity of the pectoral fins extends nearly as far as a vertical line drawn at the posterior margin of the dorsal; the fins themselves being rather slender. The ventrals are broad, somewhat shorter than the pectorals, and extend beyond the anterior margin of the anal.

Syn.—*Pimelodus affinis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 26.

This species is very closely allied to *P. coerulescens*, Rafin. and distinguished from it by a more advanced position of the dorsal fin, and a greater elongation of the barbels; the maxillar pair extending beyond the base of the pectorals; the inner mental pair being shorter than the external one. The supra-nasals are the smallest, and when lying over the surface of the head they extend as far back as a line drawn from one pupil to the other.

D I, 6; A 35; C 5, 1, 8, 7, 1, 6; V 8; P I, 10.

The color is reddish brown above, silvery white beneath, occasionally marked with small sub-circular black spots. The fins being uniformly olivaceous or greyish.

Plate XVI, fig. 1 represents *Pimelodus affinis*, somewhat reduced in size; fig. 2, is an outline of the same fish seen from above; and, fig. 3, the head seen from beneath.

Plate XVII illustrates three stages of growth of the same species, showing the constancy of its specific characters, and particularly interesting as compared to the following species figured on Plate XVIII.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
837	10	Adult..	Mouth of Rio Grande del Norte....	1854	Maj. Emory........	Alcoholic.	Jno. H. Clark....
838	7	...do...	Brownsville, Texas................	1851	Capt. Van Vliet....	....do....	Capt. Van Vliet..

2. PIMELODUS VULPES, Grd.

PLATE XVIII.

SPEC. CHAR.—In its general aspect this species resembles the preceding one, from which it differs chiefly by a shorter and deeper anal fin, smaller spines at the anterior margin of the dorsal and pectorals, and, perhaps, a caudal less deeply furcated. The ventrals are rather short and broad, being also inserted further apart from the origin of the anal, since their posterior extremity extends to the anterior edge of the latter fin and no further. The posterior extremity of the adipose fin is nearly even with the terminus of the anal The head enters about five times in the total length; the mouth being larger than in *P. affinis*.

The color of the dorsal region is of a greyish black or slate hue, somewhat lighter on the flanks and beneath. Small, sub-circular, black spots may sometimes be observed scattered over the body. The fins, as usual, being unicolor.

D I, 6; A 23; C 5, 1, 8, 7, 1, 6; V 8; P 1, 8.

Plate XVIII represents various stages of growth of *Pimelodus vulpes*, size of life.

List of specimens.

Catal. No.	No. of spec	Age.	Locality.	When collected.	Whence obtained.	Orig. No.	Nature of specimens.	Collected by—
843	2	......	Live Oak creek, Texas........	1854	Major Emory.......	90	Alcoholic.	Dr. C. B. Kennerly.
844	1	......	Camanche Spring, Texas......	1851	Col. J. D. Graham..	....	....do....	John H. Clark....
845	6	......	Rio Leona: Nueces, Texas....	1851	......do..........	....	....do....	......do..........
846	4	......	Piedra Painte, Texas..........	1851	......do..........	....	....do....	.....do..........
847	1	......	Devil's river, Texas	1851	......do..........	....	....do....	......do..........
848	1	Young	Camanche Spring, Texas......	1851	......do..........	....	....do....	......do..........
849	2	......	Rio Salado, Texas............	1851	......do..........	....	....do....	......do..........

Family CYPRINIDAE.

ICTIOBUS TUMIDUS, Grd.

PLATE XIX, FIGS. 1—4.

SPEC. CHAR.—Head constituting about the fifth of the total length. Snout sub-conical. Mouth very small and prominent; lips small. Eyes very large, subcircular, their diameter being contained about four times in the length of the side of the head. Anterior margin of dorsal fin nearly equi-distant between the extremity of the snout and the insertion of the caudal. Tips of posterior rays of anal extending as far as the base of the caudal. Extremities of ventral fins reaching the vent; extremities of pectorals extending almost to the base of the ventrals. Caudal fin furcated and equal to the head in length.

SYN.—*Carpiodes tumidus*, B & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 28.
Ictiobus tumidus, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 170.

The scales are nearly as deep as long, exhibiting radiating furrows upon their anterior and posterior sections. Thirteen longitudinal series may be counted upon the line of greatest depth, and from thirty-seven to thirty-eight scales in the lateral line.

D 2, 27; A 2, 9; C 5, 1, 8, 8, 1, 4; V 2, 9; P 16.

The color is light reddish brown above, and yellowish white beneath.

Plate XIX, fig. 1 represents *Ictiobus tumidus*, size of life; fig. 2 is a scale from the dorsal region; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
180	6	Near Fort Brown, Texas.........	1853	Major Emory......	Alcoholic..	John H. Clark......

1. MOXOSTOMA KENNERLII, Grd.

PLATE XX, FIGS. 7—9.

SPEC. CHAR.—In its general physiognomy this species resembles *M. oblongum*, more than any other of its genus. The greatest depth, taken immediately in advance of the dorsal fin, does not enter quite four times and a half in the total length. The head forms a little less than the fifth of that same length. The lower lip is rather broad and very little emarginated, whilst in *M. claviformis* it is very thin and quite sub-divided. The anterior margin of the dorsal is much nearer the tip of the snout than the insertion of the caudal; the upper margin of that fin is sub-convex and as long as high, whilst in *M. claviformis* the height is much greater than the length. The caudal is deeply concave posteriorly; the anal is deep and narrow, its extremity extending, as usual in the genus, to the base of the caudal. The ventrals have pretty much the same position as in *M. claviformis*.

SYN.—*Moxostoma kennerlii*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 171.

The anterior two rays, in both the dorsal and anal fins, are mere rudiments; also the anterior one in the ventral fins. The scales are not quite so long as in *M. claviformis*.

D 2, 12; A 2, 8; C 4, 1, 8, 8, 1, 3; V 1, 9; P 13.

Plate XX, fig. 7 represents *Moxostoma kennerlii*, size of life; fig. 8 is a scale from the dorsal region; and, fig. 9, a scale from the abdominal region.

List of specimens.

Catal. No	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
161	2735	7	Adult.	Dry creek, near Victoria, Texas.	1854	Major Emory.	Alcoholic	Dr. C. B. Kennerly.

2. MOXOSTOMA VICTORIAE, Grd.

PLATE XX, FIGS. 1—3.

SPEC. CHAR.—Body elongated, fusiform, reminding us, by its general appearance, of certain species of Mullet (*Mugil*). The greatest depth is nearly equal to the length of the head, which constitutes the fifth of the entire length, the lobes of the caudal fin excepted. The dorsal fin is higher than long, and its anterior margin is situated nearer the tip of the snout than the insertion of the caudal fin. The latter is furcated.

SYN.—*Moxostoma victoriae*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 171.

The sub-opercle is well developed; the eye is sub-circular, its diameter being contained four times and a half in the length of the side of the head. The snout is rather pointed, sub-conical, and the mouth, which is small, placed entirely in advance of the orbit.

D 14; A 10; C 6, 1, 8, 8, 1, 5; V 9; P 17.

Twelve longitudinal rows of scales may be counted upon the greatest depth. The scales upon the dorsal and lateral regions are provided with a black dot or spot upon the anterior part of the exposed portion of the scale. Greatest length of specimens observed, six inches and a half.

Plate XX, fig. 1 represents *Moxostoma victoriae*, size of life; fig. 2 is a scale from the dorsal region; and, fig. 3, a scale from the abdominal region.

List of specimen.

Catalogue number.	No. of specimen.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
164	2	Dry creek, near Victoria, Texas.	1854	Major Emory	Alcoholic.	Dr. C. B. Kennerly.

3. MOXOSTOMA CAMPBELLI, Grd.

PLATE XX, FIGS. 4—6.

SPEC. CHAR.—Body sub-fusiform and elongated like the preceding species, which it resembles in its general outline, and in the proportions of the head and depth of the body towards the total length. The snout is likewise pointed and sub-conical, but the eye is much larger, and the sub-opercle very exiguously developed. The position and shape of the fins do not differ materially from the preceding species, with the exception of the caudal, which is concave posteriorly instead of being furcated.

SYN.—*Moxostoma campbelli*, GRD. in Proc. Acad Nat. Sc. Philad. VIII, 1856, 172.

The scales are smaller than in *M. kennerlii;* thirteen rows instead of twelve are to be observed upon the region of the greatest depth of the body.

D 15; A 10; C 5, 1, 8, 8, 1, 5; V 9; P 15.

Plate XX, fig. 4 represents *Moxostoma campbelli*, size of life; fig 5 is a scale from the dorsal region; and, fig. 6, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
162	1	Devil's river, Texas..................	1851	Col. J. D. Graham.	Alcoholic...	John H. Clark....
163	2	Live Oak creek, Texas.............	1854	Major Emory	....do......	A. H. Campbel...

1. PTYCHOSTOMUS CONGESTUS, Grd.

PLATE XXI, FIGS. 5—8.

SPEC. CHAR.—The head is contained five times and a half in the total length. The snout is blunt, abruptly truncated, and the mouth very small. The eyes are large, sub-elliptical, and their longitudinal diameter contained four times in the length of the head from the tip of snout to posterior margin of opercular apparatus. The dorsal fin is sub-quadrangular, its anterior margin being nearer the tip of snout than the base of caudal. The caudal itself is semi-lunar, with its lobes rounded. The anal is narrow; its length is less than half its height. The ventrals are inserted under the middle of the dorsal. The tip of the pectorals does not reach the base of the ventrals.

SYN.—*Catostomus congestus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 27.
Ptychostomus congestus, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 172.

The scales are large; there are fourteen rows across the line of the greatest depth of the body. The lateral line, which runs straight along the middle of the side, contains about forty-six scales.

D 2, 12; A 1 7 or 8; C 4, 1, 8, 8, 1, 3; V 9; P 17.

The color, as preserved in alcohol, is uniform reddish brown above, lighter beneath; sides silvery. The fins are unicolor, and of the tint of the region to which they belong.

Plate XXI, fig. 5 represents *Ptychostomus congestus*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor'g No. of teeth.	No. of spec.	Locality.	When collected	Whence obtained.	Nature of specimens.	Collected by—
171	2760	2	Rio Salado, Texas........	1851	Col. J. D. Graham.	Alcoholic...	John H. Clark....

2. PTYCHOSTOMUS ALBIDUS, Grd.

PLATE XIX, FIGS. 5—8.

The general physiognomy of this species reminds us of *P. congestus*, although the body is more slender, the head more elongated, and the caudal fin more deeply furcated. The mouth is a great deal larger; whilst the scales, which are longer than deep, are smaller than in the species just alluded to. The ventral fins are missing upon the specimens before us; their insertion alone could be observed. The anal is quite narrow and slender. The color is greyish white above, and greyish silver beneath.

SYN.—*Ptychostomus albidus*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 172.

Plate XIX, fig. 5 represents *Ptychostomus albidus*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimens	Collected by—
170	2	Rio San Juan, near Monterey, New Leon...........................	1853	Lt. D. N. Couch..	Alcoholic...	Lieut. Couch.....

MINOMUS, Girard.

Gen. Char.—Body elongated and fusiform. Head longer than deep, dorsal fin either higher than long, or with both dimensions equal. The lips being tuberculated, moderately bilobed. The pharyngeals not expanded laterally, but considerably bent inwardly. The teeth compressed, decidedly bicuspid, but the inner projection more developed than the outer. The scales being nearly of the same size, though slightly smaller anteriorly than posteriorly. They are sub-elliptical, longer than deep, with radiating furrows upon the anterior and posterior sections; else all around.

Syn.—*Minomus*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 173.

1. MINOMUS INSIGNIS, Grd.

Plate XXI, Figs. 1—4.

Spec. Char.—Body sub-fusiform, elongated, compressed. Head forming two-ninths of the total length. Mouth of medium size, surrounded with considerably developed lips. Eyes large, sub-elliptical; their longitudinal diameter contained almost six times in the length of the side of head. The dorsal fin is sub-quadrangular; its anterior margin is situated midway between the snout and the base of caudal fin. The latter is posteriorly furcated, with its angles sub-acute. The anal is quite narrow and elongated; its base enters three times in the length of its anterior margin. The ventrals are inserted under the posterior half of the dorsal; their posterior extremity does not reach the vent. The pectorals are elongated, their tips not extending as far back as the anterior margin of the dorsal.

Syn.—*Catostomus insignis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 28.
Minomus insignis, Grd. in Proc. Acad. Nat. Sc. Philad. VIII. 1856, 173.

The scales are large; there are twenty rows of them between the base of the ventrals and the dorsal line. The lateral line takes a straight course along the middle of the sides, and is composed of about sixty scales.

D 2 11; A 2, 7 or 8; C 3, 1, 8, 8, 1, 3; V 10; P 18.

The color, as preserved in alcohol, is dark reddish brown above and on the sides, lighter beneath. There is a black dot at the base of each scale, giving a dotted appearance to the body. The fins are unicolor.

Plate XXI, fig. 1 represents *Minomus insignis*, size of life; fig. 2 is a scale from the dorsal region; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by -
169	2738	4	Adult	Rio San Pedro, tributary of Rio Gila.	1851	Col. J. D. Graham	Alcoholic.	John H. Clark.

2. MINOMUS PLEBEIUS, Grd.

PLATE XXII, FIGS. 1—4.

SPEC. CHAR.—Body sub-fusiform, compressed. Head elongated, sub-conical, forming the fifth of the entire length. Mouth of medium size. Eyes large, sub-elliptical, their longitudinal diameter being contained about five times in the length of side of head. Dorsal fin sub-quadrangular, its anterior margin being equidistant between the tip of snout and the first rudimentary rays at the upper lobe of the caudal. The latter is slightly concave posteriorly, and the lobes rounded off. The base of the anal is contained nearly three times in its height, and when brought backwards its tip extends to the rudimentary rays at the inferior lobe of the caudal fin. The ventrals are inserted under the posterior third of the dorsal; bent backwards, their tip does not reach as far as the anus. The pectorals are of medium development, sub-ovate, posteriorly acute.

SYN.—*Catostomus plebeius*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 28.
Minomos plebeius, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 173.

The scales are of medium size, considerably the largest on the peduncle of the tail. Twenty-eight to thirty rows from the base of the ventrals to the dorsal fin. About eighty in the lateral line, which is not discernible as far as the base of caudal fin.

D 1, 9 or 10; A 1, 7; C 3, 1, 8, 8, 1, 2; V 8; P 14.

The color, as preserved in alcohol, is dark brown on the upper regions, faintly mottled with blackish patches. The sides and belly exhibit traces of orange in some of the specimens, in others it is pale yellowish. The fins are unicolor; the dorsal, caudal, and pectorals, blackish brown; the anals and ventrals, yellowish.

Plate XXII, fig. 1 represents *Minomus plebeius*, size of life; fig. 2 is a scale from the dorsal region; fig. 3, scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
168	2737	8	Adult	Rio Mimbres, tributary of Lake Guzman.	1851	Col. J. D. Graham	Alcoholic	John H. Clark......

3. MINOMUS CLARKI, Grd.

PLATE XXII, FIGS. 5—8.

SPEC. CHAR.—A rather small and short species, in shape sub-fusiform and compressed. The dorsal line is gently arched. Head small, sub-conical, truncated anteriorly, forming a little less than the sixth of the total length. The eyes are sub-circular, of medium size, their diameter being contained about four times in the length of the side of the head. The upper margin of dorsal fin is slightly concave; its anterior margin as high as long. The caudal is sub-crescentric posteriorly, with rounded lobes. The base of the anal is narrow; its height is twice and a half the width. The insertion of the ventrals is under the posterior third of the dorsal. The pectorals are elongated and of medium development.

SYN.—*Catostomus clarkii*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 27.
Minomus clarkii, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 173.

The scales are rather large, about twenty rows on a cross line from base of ventrals to anterior margin of dorsal. Sixty-eight to seventy scales in the lateral line, which extends to caudal fin.

D 2, 11 or 12; A 2, 7; C 5, 1, 8, 8, 1, 4; V 10; P 17.

Colors in alcohol: greyish brown above, with scattered darker nebulous spots; sides greyish; belly whitish; fins unicolor, vertical ones greyish; horizontal ones yellowish.

Plate XXII, fig. 5 represents *Minomus clarki*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
166	....	4	Young.	Rio Santa Cruz, or Sonoito	1851	Col. J. D. Graham	Alcoholic	John H. Clark....
167	2736	4	Adult..	Rio Sonoito............	1851	.....do..........	....do....	

1. ACOMUS LATIPINNIS, Grd.

PLATE XXIV, FIGS. 1—6.

SPEC. CHAR.—General aspect sub-fusiform. Head proportionally small, and contained about five times and a-half in the total length. Eyes small, situated near the upper surface of the head. Mouth small, also, the lips being large and fleshy. The fins are all very much developed, constituting a prominent specific feature. Tho upper margin of the dorsal is slightly concave, and the posterior margin of the caudal crescent-shaped; the anal, ventrals, and pectorals being exteriorly rounded or lanceolated.

SYN.—*Catostomus latipinnis*, B & G., in Proc. Acad. Nat. Sc. Philad. VI, 1853, 388.
Acomus latipinnis, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 173.

The scales are of medium size, sub-elliptical, longer than deep, and considerably smaller on the back than on the sides and on the abdomen. The lateral line runs along the middle of the flanks from the opercle to the base of the caudal fin.

D 1, 14; A 2, 8; C 5, 1, 8, 8, 1, 6; V 10; P 18.

The upper part of the body is reddish brown; the upper part of the tail and the flanks are greenish brown; the abdomen being yellowish orange. The caudal fin is olive; the anal, ventrals, and pectorals exhibit traces of deep orange, especially on their outer margin.

Plate XXIV, fig. 1 represents *Acomus latipinnis*, somewhat reduced in size; fig. 2 is the head from beneath, to show the mouth and lips; fig. 3, the head from above; fig. 4, a scale from the dorsal region; fig. 5, a scale from the lateral line; and, fig. 6, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
254	2803	2	Adult.	Rio San Pedro, tributary of the Rio Gila.	1851	Col. J. D. Graham	Alcoholic.	John H. Clark ....
255	....	2	......	..........do............	1851	......do..........	....do....	........do............

2. ACOMUS GUZMANIENSIS, Grd.

PLATE XXIII, FIGS. 6—10.

SPEC. CHAR.—The head forms the fifth of the total length; its shape is sub-quadrangular, sub-pyramidal. The eyes are small and circular. The lips are well developed and covered with large papillae, but the posterior one is less indented than in *A. latipinnis*. It has the general physiognomy of *A. latipinnis*, owing to the great development of its fins. It is, however, very readily distinguished from the latter by the presence of much larger scales, especially upon the dorsal region. In shape, the scales are similar to those of *A. latipinnis*, being elliptical, somewhat longer than deep, but the radiating furrows are more numerous.

SYN.—*Catostomus (Acomus) guzmaniensis*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 173.

The anterior two rays, in both the dorsal and anal fins, are rudimentary; so also the exterior one in the ventrals. The upper regions are purplish black, with an orange lateral band from head to tail, the inferior regions being yellowish white.

D 2, 13; A 2, 7; C 4, 1, 8, 8, 1, 4,; V 1, 9; P 19.

Plate XXIII, fig. 6 represents *Acomus guzmaniensis*, size of life; fig. 7 exhibiting the mouth and lips; fig. 8, a dorsal scale; fig. 9, a scale from the lateral line; and, fig. 10, a scale from the abdominal region.

List of specimens.

Catal. No.	No of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
260	2		Janos River, trib. of Lake Guzman, Chih'a.	1854	Maj. Emory..........	Alcoholic.	Dr. C. B. Kennerly...

CATOSTOMUS BERNARDINI, Grd.

Plate XXIII, Figs. 1—5.

Spec. Char.—A specimen of seven inches and a-half, slender and graceful; the head forming somewhat less than the fifth of the total length. The eye is large and sub-circular; its horizontal diameter entering a little over four times in the length of the side of the head. The upper margin of the dorsal is sub-convex, the tips of its posterior rays reaching a vertical line which would intersect the anus. The caudal is sub-crescentic posteriorly. The ventrals and pectorals are well developed.

Syn.—*Catostomus bernardini*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 175.

The scales are elongated, somewhat irregular upon their anterior and posterior edges, and exhibit radiating furrows upon both the anterior and posterior sections, and apparently more numerous upon the former section than upon the latter.

D 15; A 10; C 5, 1, 8, 8, 1, 5; V 10; P 16.

The color is uniform purplish black above, and yellowish white beneath.

Plate XXIII, fig. 1 represents *Catostomus bernardini*, size of life; fig. 2 exhibiting the mouth and lips; fig. 3, a dorsal scale; fig. 4, a scale from the lateral line; and, fig. 5, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
174	1		San Bernandino, in an affluent of the Rio Huagui, west of the Sierra Madre, Mex.	1854	Maj. Emory..........	Alcoholic.	Dr. C. B. Kennerly ...

CAMPOSTOMA, Agass.

Gen. Char.—Head sub-conical; body sub-fusiform: both compressed. Snout obtuse and protractile. Mouth inferior, though its gape is horizontal. Lips very conspicuously developed; no barbels or cirrhi. Eyes of moderate development; isthmus very wide. Origin of ventrals situated in advance of the anterior margin of the dorsal. Caudal furcated. Scales of dorsal region deeper than long; of the abdominal region longer than deep, with radiating furrows upon the posterior section or posterior half. Pharyngeal bones strongly curved, with a small dilatation upon their convexity. Teeth of the cultriform kind, of the grinding type, occasionally somewhat hooked. They are disposed upon a single row of four, or else upon a double row of four and one, in the following manner: 4—4, or 1 | 4—4 | 1.

Syn.—*Campostoma*, Agass. in Amer. Journ. of Sc. and Arts, 2d ser. XIX, 1855, 219.—Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 176.

1. CAMPOSTOMA ORNATUM, Grd.

Plate XXV, Figs. 1—4.

Spec. Char.—It is larger, more elongated, and more fusiform than *C. anomalum.* The head enters four times and a half in the total length. The diameter of the eye enters nearly six times in the length of the side of the head The scales are much smaller than in *C. anomalum* ; they are sub-circular, rather deeper than long, with radiating furrows upon their posterior half.

Syn.—*Campostoma ornatum*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 176.

The upper regions are purplish black ; the inferior regions golden brown and yellow, with black spots scattered over the flanks. A black patch at the base of all the fins, otherwise the latter are orange or yellowish brown.

D 2, 8 ; A 2, 8 ; C 7, 1, 9, 8, 1, 6 ; V 8 ; P 16.

Plate XXV, fig. 1, represents *Campostoma ornatum*, size of life ; fig. 2 is a scale from the dorsal region ; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
77	2682	4	Adult.	Chihuahua river & trib's.	1855	Jno. Potts, Esq....	Alcoholic.	Jno. Potts, Esq........

2. CAMPOSTOMA FORMOSULUM, Grd.

Plate XXV, Figs. 5—8.

Spec. Char.—The head is a little less than the fifth of the total length, and so also is the caudal fin. It resembles more *C. anomalum* than *C. ornatum* ; the most conspicuous difference consists in the presence of larger scales, the posterior margin of which being scalloped. The radiating furrows are very conspicuous, occupying the posterior section of the scale only.

Syn.—*Campostoma formosulum*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 176.

The ground color of the dorsal region is dark purple, with scattered black irregular spots ; beneath yellowish brown. The dorsal fin and the base of the caudal exhibiting a black patch.

Plate XXV, fig. 5, represents *Campostoma formosulum,* size of life ; fig. 6, a scale from the dorsal region ; fig. 7, a scale from the lateral line ; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal No.	Cor No. of teeth.	No. of spec.	Age	Locality.	When collected.	Whence obtained	Orig'l No.	Nature of specimen.	Collected by—
76	2681	15	Adult.	Rio Sabinal, trib. of Rio San Antonio, Texas.	1854	Major Emory...	116 117 118	Alcoholic.	Dr C. B. Kennerly.

3. CAMPOSTOMA NASUTUM, Grd.

PLATE XXV, FIGS. 9—12.

SPEC. CHAR.—It is a short and rather compact species, with the peduncle of the tail rather tapering. Its most prominent character consists in its thick and protruding snout, which overlaps the lower jaw more than in the species above referred to. The head enters four times and a half in the total length. The scales are proportionally larger than in any of the known species of this genus.

SYN.— *Campostoma nasutum*, GRD in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 176.

The ground color is greyish above, and whitish or yellowish beneath; upper region of body and flanks occasionally marmorated. A black patch at the base of the caudal and dorsal fins.

Plate XXV, fig. 9, represents *Campostoma nasutum*, size of life; fig. 10 is a scale from the dorsal region; fig. 11, a scale from the lateral line; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
75	2680	10	Cadereita, New Leon	1853	Lt. D. N. Couch..	Alcoholic.	Lt. D. N. Couch......
74	2679	4	Acapulco, New Leon, Mex..	1853	........do	...do....	..........do..........

1. DIONDA SERENA, Grd.

PLATE XXVI, FIGS. 9—12.

SPEC. CHAR.—Its form is slender and elongated, the dorsal outline being nearly straight; the head enters five times and a half in the total length. The eye is large and circular; its diameter entering only three times in the length of the side of the head. The insertion of the ventrals takes place immediately opposite the anterior margin of the dorsal fin. The pectorals are long and slender, even more so than in *D. episcopa*.

SYN.—*Dionda serena*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 177.

The dorsal region is light brown, the flanks and abdomen being silvery, with the scales of the lateral line dotted with black, imitating spots. A black spot at the base of the caudal fin.

D 1, 8; A 2, 7; C 4, 1, 9, 8, 1, 3; V 8; P 13.

Plate XXVI, fig. 9, represents *Dionda serena*, size of life; fig. 10 is a scale from the dorsal region; fig. 11, a scale from the lateral line; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
43	2656	10	Rio Sabinal, Texas.....	1854	Major Emory....	Alcoholic.	Dr. C. B. Kennerly.....

2. DIONDA TEXENSIS, Grd.

PLATE XXVI, FIGS. 21—24.

SPEC. CHAR.—Is a very characteristic species. The body is rather deep upon its middle, and the lateral line somewhat deflexed. The head is quite small and sub-conical, entering five times and a half in the total length. The eye is large and circular. The insertion of the ventral fin is placed a little posteriorly to the anterior margin of the dorsal. The dorsal region is greyish brown; the abdominal region greyish white; a diffused greyish black band may be observed along the middle of the flanks, embracing the lateral line beneath, and a black spot at the base of the caudal. The ventrals and pectorals are yellow.

SYN.—*Dionda texensis*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 177.

Plate XXVI, fig. 21, represents *Dionda texensis*, size of life; fig. 22 is a scale from the dorsal region; fig. 23, a scale from the lateral line; and, fig. 24, a scale from the abdominal region.

List of specimens.

Catalogue No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
44	2657	30	Rio Nueces, Texas-----	1851	Col. J. D. Graham.	Alcoholic-	Jno. H. Clark-------

3. DIONDA ARGENTOSA, Grd.

Plate XXVI, Figs. 5—8.

Spec. Char.—Has a small head and an obtuse snout, a rather slender and compressed body. The head constitutes two-elevenths of the total length. The insertion of the ventrals is situated opposite the anterior margin of the dorsal. The scales being quite large, the lateral line is slightly deflected upon the thoracic region. Color of the dorsal region reddish brown; sides and abdomen as if painted over with silver or quicksilver. Fins olivaceous.

Syn.—*Dionda argentosa*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 178.

Plate XXVI, fig. 5, represents *Dionda argentosa*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen	Collected by—
32	2646	10	San Felipe creek, Tex.	1851	Col. J. D. Graham	Alcoholic..........	John H. Clark...
33	2647	4	Devil's river, Texas	1851	........do........	....do..............	......do..........

4. DIONDA CHRYSITIS, Grd.

Plate XXVI, Figs. 13—16.

Spec. Char.—Very slender and compressed; head very small and obtuse, contained six times in the total length. Eyes large and circular. Origin of ventrals opposite the anterior margin of dorsal. Upper surface of head tuberculous. Scales large. Dorsal region reddish brown; sides and abdomen as if painted with gold. A black spot upon the base of the caudal fin Fins themselves yellowish or olivaceous.

Syn.—*Dionda chrysitis*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 178.

Plate XXVI, fig. 13, represents *Dionda chrysitis*, size of life; fig. 14, a scale from the dorsal region; fig. 15, a scale from the lateral line; and, fig. 16, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
37	2651	20	Live Oak creek, Texas..	1851	Col. J. D. Graham.	Alcoholic ..	John H. Clark............

5. DIONDA MELANOPS, Grd.

PLATE XXVI, FIGS. 17—20.

SPEC. CHAR.—A rather short and deep body characterizes this species. The head is proportionally well developed, forming less than the fifth of the total length. The snout is conical and not abruptly truncated. The insertion of the ventrals is situated somewhat posteriorly to the anterior margin of the dorsal. Scales large. The dorsal region is blackish; the sides and abdomen are dotted with black upon a bluish lead ground, giving the whole fish a dark appearance. A black spot upon the base of the caudal fin.

SYN.—*Dionda melanops*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 178.

Plate XXVI, fig. 17, represents *Dionda melanops*, size of life; fig. 18 is a scale from the dorsal region; fig. 19, a scale from the lateral line; fig. 20, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No of teeth	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
38	2652	5	Buena Vista, Coahuila......	1853	Lieut. D. N. Couch...	Alcoholic ..	Lieut. Couch.......

6. DIONDA COUCHI, Grd.

PLATE XXVI, FIGS. 1—4.

SPEC. CHAR.—Though closely allied to the preceding, it may readily be distinguished from it by a more elongated body and more elongated head. The snout is rounded. The eye is circular and of medium size. The ventrals are inserted posterior to the anterior margin of the dorsal. The scales are quite large. Upper regions greyish black, sides and abdomen yellowish or whitish, either unicolor or maculated. A black spot upon the base of the caudal.

SYN.—*Dionda couchi*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 178.

Plate XXVI, fig. 1, represents *Dionda couchi*, size of life; fig. 2, a scale from the dorsal region; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
40	....	4	Guajuco, New Leon........	1853	Lieut. D. N. Couch...	Alcoholic ..	Lieut. Couch.......
41	2654	5	Monterey, N. L............	1853	..........do..........	....do.....	......do............
42	2655	4	Cadereita, N. L............	1853	..........do..........	....do.....	......do............

ALGOMA, Girard.

GEN. CHAR.—Partakes, in a measure, of the characters of *Hyborhynchus* and *Pimephales*. The teeth are of the cultriform kind, of the grinding type, disposed upon a single row of four: 4—4. The grinding surface is nearly linear, in which respect the teeth resemble more those of *Pimephales* than of *Hyborhynchus*. The pharyngeal bones do not differ materially in these genera. The head is small and sub-truncated, the mouth small, with the lower jaw shortest, and overlapped by the upper, a feature also noticed in *Hyborhynchus*. The isthmus is of a moderate size; the eye well developed. The insertion of the ventrals takes place posterior to the anterior margin of the dorsal. The latter is higher than long, without a short and thick ray anteriorly. The anal is shaped like the dorsal. The caudal is furcated. The scales are large, and deeper than long, furrowed upon the posterior section only; the lateral line sub-median, is slightly deflexed upon the abdomen.

SYN.—*Algoma*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 180.

The large scales will serve to distinguish, upon a first glimpse, this genus from both *Hyborhynchus* and *Pimephales*.

1. ALGOMA AMARA, Grd.

Plate XXVII, Figs. 17—20.

Spec. Char.—Head constituting about the fifth of the total length. Ten rows of scales upon the line of greatest depth, five above the lateral line and four beneath it. The upper surface of the head and nape is flattened, as in *Hydrargyra* and *Fundulus*.

Syn.—*Algoma amara*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 180.

The dorsal region is of a pale red, the sides are silvery, whilst the abdomen is whitish.

D 1, 8; A 2, 8; C 7, 1, 9, 8, 1, 6; V 8; P 15 or 16.

Plate XXVII, fig. 17, represents *Algoma amara*, size of life; fig. 18 is a scale from the dorsal region; fig. 19, a scale from the lateral line; and, fig. 20, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No of teeth.	No. of spec.	Locality	When collected.	Whence obtained.	Nature of specimen.	Collected by—
149	2727	1	Laguna, near Fort Brown, Tex.	1853	Maj. Emory..........	Alcoholic.	Jno. H. Clark......

2. ALGOMA FLUVIATILIS, Grd.

Plate XXVII, Figs. 13—16.

Spec. Char.—This species has the general aspect of a young *Campostoma*, and might easily be taken as such. Its mouth and eye are smaller than in the preceding species. The upper lobe of the caudal is longer than the lower lobe. There are also ten longitudinal rows of scales upon the line of greatest depth. The upper surface of the head exhibiting numerous small spiny tubercles, as fishes sometimes have during the breeding season.

Syn.—*Algoma fluviatilis*, Grd. in Proc. Acad. Nat. Sc Philad. VIII, 1856, 180.

Color reddish brown above; yellowish brown beneath.

D 1, 8; A 8; C 5, 1, 9, 8, 1, 4; V 8; P 17.

Plate XXVII, fig. 13, represents *Algoma fluviatilis*, size of life; fig. 14 is a scale from the dorsal region; fig. 15, a scale from the lateral line; and, fig. 16, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
148	2726	1	Adult	Near Monterey, New Leon.	1853	Lt. D. N. Couch....	Alcoholic.	Lt. D. N. Couch....

COCHLOGNATHUS, B. & G.

Gen. Char.—Under the external aspect of *Pimephales*, it presents that unique peculiarity in the cyprinoid family, of having spoon-shaped bony expansions of the jaws. There is one on each side on the upper as well as on the lower jaw, exactly as in the genus *Tetraodon;* their edge being sharp and cutting. The head is short and the snout very blunt. The dorsal fin has the structure of that of *Pimephales;* the insertion of the ventrals is situated under the anterior margin of the dorsal, the caudal being furcated. The scales are large, deeper than long, the lateral line following the middle of the flanks. The isthmus is rather wide. The pharyngeals have the same shape and form as in *Pimephales;* the teeth, however, are more slender and concave upon the grinding surface, giving them the appearance of being bent backwards. They are cultriform, of the grinding type, a little more conspicuously hooked, and disposed upon a single row of four : 4—4.

Syn.—*Cochlognathus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 150.—Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 181.

We are acquainted so far with but one species of this genus, referred to hereon.

COCHLOGNATHUS ORNATUS, B. & G.

Plate XXXV, Figs. 12—17.

Spec. Char.—Head forming two-ninths of the entire length ; snout abruptly rounded off. Mouth proportionally small, terminal ; its gape somewhat oblique. Eyes rather above the medium size ; their diameter being contained four times in the length of the side of the head. Body much compressed, covered with large scales disposed upon twelve longitudinal series across the line of greatest depth. Lateral line deflexed downwards upon the abdomen. Anterior margin of dorsal nearly equidistant between the snout and the rudimentary rays of the caudal. Anal situated entirely backwards of the dorsal. Caudal furcated. Insertion of ventrals situated opposite the anterior margin of dorsal ; tip of pectoral not reaching them.

Syn.—*Cochlognathus ornatus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 158.—Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 181.

The outline of the scales is quite irregular; they are very much deeper than long, with rather short radiating furrows on their posterior margin only.

D 1, 8; A 6; C 4, 1, 9, 8, 1, 3; V 8; P 12.

The colors, as preserved in alcohol, present a reddish brown ground, and a dark lateral band or stripe. The dorsal fin exhibits two elongated dark spots—one anteriorly and basal, the other posteriorly and nearer to its tip. The posterior half of the caudal has likewise a darker hue than its anterior and basal half, which is of a dull orange, as is also its extreme margin.

Plate XXXV, fig. 12, represents *Cochlognathus ornatus*, size of life ; fig. 13 exhibits the jaws in profile, whilst fig. 14 is a front view of the same, the mouth being open ; fig. 15 is a dorsal scale ; fig. 16, a scale from the lateral line ; and, fig. 17, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.
150	2728	6	Adult ...	Brownsville, Texas.......	1852	Captain Van Vliet........	Alcoholic.

ALGANSEA TINCELLA, Grd.

Plate XXVII, Figs. 1—4.

Spec. Char.—The scales in this species are next in size to those of *A. obesa*. There are about twelve rows beneath, and fourteen above, the lateral line. I say about, because the specimens are somewhat mutilated, as most market specimens are. The insertion of the ventrals is situated a little posteriorly to the anterior margin of the dorsal. The eye is smaller than in any of the other known species of this genus.

Syn.—*Leuciscus tincella*, Valenc. in *Cuv. & Val.* Hist. nat. des Poiss. XVII, 1854, 323.
Algansea tincella, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 183.

The scales are elongated, sub-elliptical, provided with radiating furrows upon their entire periphery.

D 1, 9 ; A 1, 8 ; C 6, 1, 9, 8, 1, 5 ; V 9 ; P 17.

The color is reddish brown above, silvery on the sides, and whitish beneath.

Plate XXVII, fig. 1, represents *Algansea tincella*, size of life ; fig. 2 is a scale from the dorsal region ; fig. 3, a scale from the lateral line ; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor'g No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
195	2753	6	Adult..	Near the City of Mexico.	1852	Major Wm. Rich.....	Alcoholic.	Major Wm. Rich...

1. ARGYREUS OSCULUS, Grd.

PLATE XXVII, FIGS. 9—12.

SPEC. CHAR.—Has more the fascies of *A. atronasus* than of any other of its congeners, both by the outline of its body and head, and the shape and position of the mouth. The head is comparatively small, forming the fifth of the length, with the exception of the fork of the caudal. The eye is rather large and sub-circular, its diameter entering about four times in the length of the side of the head. The dorsal and anal fins are well developed, the former being convex superiorly, and the latter sub-convex exteriorly. The posterior margin of the caudal is crescentic. The posterior extremity of the ventrals extend as far as the vent, which is not the case in *A. dulcis* and *A. nubilis*.

SYN.—*Argyreus osculus*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 186.

The anterior two rays of both the dorsal and anal fins are mere rudiments, as elsewhere stated.

D 2, 8 ; A 2, 7 ; C 5, 1, 9, 8, 1, 6 ; V 8 ; P 14.

The color is reddish brown above ; olivaceous on the sides, with numerous dark blotches and dots. Beneath uniform yellowish white, or silvery white.

Plate XXVII, fig. 9, represents *Argyreus osculus*, size of life ; fig. 10 is a scale from the dorsal region ; fig. 11, a scale from the lateral line ; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor'g No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
50	2663	10	Babocomori river, trib. of San Pedro river : Gila.	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark......

2. ARGYREUS NOTABILIS, Grd.

PLATE XXVII, FIGS. 5—8.

This species resembles *A. osculus* in many respects, but will always be easily distinguished from it by a more truncated snout, and, consequently, by a mouth not so deeply cleft. The dorsal fin is situated more anteriorly also. The scales are sub-elliptical, elongated, exhibiting sometimes radiating furrows upon the anterior as well as upon the posterior sections; they are proportionally smaller than in *A. osculus*, and somewhat more elongated. The ground color is yellowish brown above, golden or orange beneath, covered all over, the abdominal region excepted, with small black spots.

Syn.—*Argyreus notabilis*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 186.

Plate XXVII, fig. 5, represents *Argyreus notabilis*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdomina region.

List of specimens.

Catal. No.	Cor'g No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
49	2662	4	Rio Santa Cruz, Sonora.	1851	Col. J. D. Graham ..	Alcoholic.	John H. Clark..........

AGOSIA, Girard.

Gen. Char.—Snout rounded, slightly protruding beyond the lower jaw, though the mouth opens horizontally. The mouth is of medium size, surrounded with narrow and smooth lips, and provided upon its angle with a very small barbel. The isthmus is of moderate width. The insertion of ventrals is situated opposite the anterior margin of dorsal fin, which is higher than long. The caudal is furcated. The scales are minute, somewhat longer than deep, with radiating furrows all around. The pharyngeal bones are expanded upon their curvature. The teeth are of the prehensile kind, of the hooked type, provided with a grinding surface, strongly hooked, and disposed thus: 4—4, that is, upon one single row of four.

Syn.—*Agosia*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 186.

Now, comparing the above with the characters assigned elsewhere to *Argyreus*, we find that the most prominent difference resides in the pharyngeal teeth. The isthmus is narrower also, and the insertion of the ventrals placed further backwards.

1. AGOSIA CHRYSOGASTER, Grd.

Plate XXVIII, Figs. 5—8.

Spec. Char.—Head forming a little more than the fifth of the total length. The posterior extremity of the maxillary extends to the vertical line of the anterior rim of the orbit. The eye is large and circular; its diameter being contained about four times in the length of the side of the head. The anterior margin of the dorsal is somewhat nearer the extremity of the snout than the insertion of the caudal fin.

Syn.—*Agosia chrysogaster*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 187.

A minute rudimentary ray at the anterior margin of both the dorsal and the anal fins is not included in the following numbers.

D 10; A 7; C 4, 1, 9, 8, 1, 5; V 9; P 16.

The scales are obscurely sub-quadrangular, conspicuously longer than deep, with a proclivity of being deeper posteriorly than anteriorly.

The region above the middle of the flanks is reddish brown, spotted or dotted with black, especially upon the head; a black streak separates this region from that beneath, which is unicolor, of a golden hue.

Plate XXVIII, fig. 5, represents *Agosia chrysogaster*, size of life; fig. 6 being a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor'g No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
81	2684	8	Adult.	Rio Santa Cruz, Sonora..	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark....

2. AGOSIA METALLICA, Grd.

PLATE XXVIII, FIGS. 1—4.

SPEC. CHAR.—This species is somewhat shorter than the preceding one. It is very characteristic, and easily distinguished from its congener. The head is shorter and the snout more abruptly rounded. The eye is smaller also. The body is more gracefully sub-fusiform and compressed. The dorsal is higher and narrower, rounded superiorly. The posterior margin of the caudal is crescentic, less furcated than in *A. chrysogaster*.

SYN.—*Agosia metallica*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 187.

The formula of the fins' rays present also some differences:

D 9; A 8; C 4, 1, 9, 8, 1, 5; V 8; P 15.

The same is true with regard to the rudiment at the anterior margin of the dorsal and anal fins, and which must be sought for under the skin.

The scales are but slightly longer than deep, rather tapering posteriorly, giving to their outlines a somewhat ovoid appearance.

Upper regions greyish brown, dotted with black; inferiorly silvery and unicolor; a black streak on the sides separating the two tints.

Plate XXVIII, fig. 1, represents *Agosia metallica*, size of life; fig. 2 is a dorsal scale; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
85	2686	8	Adult.	Rio San Pedro, trib. of Gila.	1851	Col. J. D. Graham ...	Alcoholic.	Jno. H. Clark ...

GOBIO AESTIVALIS, Grd.

U. S. P. R. R. Expl. & Surveys—Fishes.—PLATE LVII, FIGS. 17—29.

SPEC. CHAR.—Head contained about four times and a half in the total length. Differs from *G. gelidus* and *G. vernalis*, its American congeners, by a rather compressed body, elevated and arched upon its middle region and tapering rapidly towards the peduncle of the tail. The snout is more protruding than in *G. gelidus*, the eye larger, and the ventral fins inserted somewhat more forwards.

SYN.—*Gobio aestivalis*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 189.

The scales are also larger, deeper than long, anteriorly sub-truncated and posteriorly rounded, with radiating furrows upon the latter section only.

D 1, 8; A 1, 7; C 3, 1, 6, 5, 1, 4; V 6; P 11.

The color is yellowish brown, somewhat lighter beneath than above, with a silvery streak along the middle of the flanks.

Plate LVII, fig. 17, represents, size of life, *Gobio aestivalis* (U. S. P. R. R. Expl. & Surveys); fig. 18 is the head seen from beneath, exhibiting the outline of the mouth; fig. 19, a dorsal scale; fig. 20, a scale from the lateral line; and, fig. 21, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.
79	1	Rio San Juan, near Cadereita, New Leon..	1853	Lt. D. N. Couch....	Alcoholic.........

MEDA, Girard

Gen. Char.—Body elongated, slender, compressed, fusiform in its profile, and scaleless. The lateral line may be traced along the middle of the flanks, slightly deflexed upon the abdomen. The head is elongated, sub-conical, rounded upon the snout, without being truncated. The mouth is proportionally large, sub-terminal, its gape slightly oblique upwards, the lower jaw fitting into the upper. No barbels. The eye large and circular. The isthmus narrow. Dorsal fin higher than long, provided anteriorly with a stout, articulated, but simple and osseous ray, grooved posteriorly, and nearly as high as the second ray, which is slightly higher, and the highest of all. The ventrals are inserted in advance of the anterior margin of the dorsal, and adherent to the ventral line for more than the half of their total length. The caudal is deeply furcated. The pharyngeal bones are slender, especially upon their inferior limbs, which are longer than the upper ones. The latter are flattened or expanded, and curved inwardly downwards. The teeth are very slender, sub-conical, compressed at their base, of the prehensile kind, of the hooked type, without grinding surface. They are disposed upon a double series of one and four: 1 | 4—4 | 1. Thus equally distinct from both *Phoxinus* and *Phoxinellus*, to which this genus bears an external resemblance.

Syn.—*Meda*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 191.

The genus here referred to differs widely from all other American cyprinoids by the presence, upon the anterior margin of the dorsal, of a stout undivided (but articulated) ray, resembling in its general appearance that which is observed in *Barbus*, *Luciobarbus*, *Scaphiodon*, and *Systomus*, differing, however, from all of these in the structure of its posterior edge, which is grooved instead of being serrated. The absence of buccal barbels in *Meda* is another feature to warrant its claims as a genus, differing from *Cyprinus*, *Carassius*, *Carpio*, &c., by characters equally obvious.

MEDA FULGIDA, Grd.

Plate XXVIII, Figs. 9 & 10.

Spec. Char.—Head constituting a little more than the fifth of the total length. The angle of the mouth corresponds to a vertical line drawn in advance of the orbit. The broad insertion of the ventrals is equally characteristic.

Syn.—*Meda fulgida*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 192.

The dorsal region is reddish yellow, the middle of the flanks appearing as though painted with silver, whilst the inferior region is of a pale yellow.

D 9; A 1, 11; C 5, 1, 9, 8, 1, 4; V 7; P 15.

Plate XXVIII, fig. 9, is a mere outline of *Meda fulgida*, double the natural size, whilst fig. 10 represents it size of life.

List of specimens.

Catal. No.	Cor. No of teeth	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
154	2730	10	Rio San Pedro, trib of Gila..	1851	Col. J. D. Graham .	Alcoholic ..	Jno. H. Clark ..

CLIOLA VELOX, Grd.

PLATE XXXI, FIGS. 21—24.

SPEC. CHAR.—A very slender and elegant species, differing from *C. vigilax* by a more conical head, much larger eyes, and larger scales. The latter are much deeper than long, with radiating furrows upon the posterior section alone. A black spot may be observed upon the anterior margin of the dorsal fin.

SYN.—*Cliola velox*, GRD. in Proc. Acad. Nat. Sc. Philad VIII, 1856, 192.

The ground color is olivaceous, with the middle of the flanks silvery; a black streak follows the course of the lateral line. A black spot exists also upon the base of the caudal fin.

Plate XXXI, fig. 21, represents *Cliola velox*, size of life; fig. 22 is a scale from the dorsal region; fig. 23, a scale from the lateral line; and, fig. 24, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
29	2643	2	San Pedro creek, tributary of Rio San Antonio, Texas.	1854	Major Emory.......	Alcoholic.	Dr. C. B. Kennerly.

1. ALBURNELLUS AMABILIS, Grd.

PLATE XXIX, FIGS. 10—13.

This is a very slender and graceful species, about two inches and a half in total length. The head constitutes the fifth of the length, and the greatest depth, the sixth.

D 1, 8; A 1, 10; C 3, 1, 9, 8, 1, 2; V 8; P 13.

There are nine longitudinal rows of scales upon the flanks, between the insertion of the ventral fins and the dorsal fin. The lateral line, as usual, follows the fourth row above the ventrals. The color is dark reddish brown, silvery upon the flanks. A black patch upon the base of the tail.

SYN.—*Alburnus amabilis*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 193.

Plate XXIX, fig. 10, represents *Alburnellus amabilis*, size of life; fig. 11 is a scale from the dorsal region; fig. 12, a scale from the lateral line; and, fig. 13, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
72	2677	15	Rio Leona, trib. of Rio Nueces, Tex..	1851	Col. J. D. Graham..	Alcoholic.	John H. Clark..

2. ALBURNELLUS MEGALOPS, Grd.

PLATE XXIX, FIGS. 1—4.

Resembles *A. amabilis* in general traits, being slender and graceful, but easily distinguished from it by a shorter and more rounded snout and a larger eye. The coloration is the same, with the exception of the black caudal patch, which does not exist here. The average size of the specimens before us is about two inches in total length.

SYN.—*Alburnellus megalops*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 193.

Plate XXIX, fig. 1, represents *Alburnellus megalops*, size of life; fig. 2 is a dorsal scale; fig. 3, a scale from the lateral line; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
69	20	San Felipe creek, Texas........	1851	Col. J. D. Graham	Alcoholic.	John H. Clark..........

3. ALBURNELLUS SOCIUS, Grd.

PLATE XXIX, FIGS. 14—17.

Resembles *A. megalops* by its snout and eye. The total length is two inches and three-quarters, the head forming the fifth part of it. The greatest depth is a little less than the length of the head. The dorsal region is olivaceous, the flanks silvery, and the belly yellowish. Opercular apparatus golden.

SYN.—*Alburnellus socius*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 193.

Plate XXIX, fig. 14, represents *Alburnellus socius*, size of life; fig. 15 is a dorsal scale; fig. 16, a scale from the lateral line; and, fig. 17, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
70	2676	20	Live Oak creek, Texas..	1851	Col. J. D. Graham	Alcoholic.	John H. Clark..........

CODOMA, Girard.

Gen. Char.—Head short, snout rounded, terminated by a small mouth, the gape of which does not reach a vertical line drawn in front of the orbit; there being no barbels at its angle, and both jaws even. The isthmus is of moderate width. The body is more or less elongated, compressed. The insertion of the ventrals is situated in advance of the anterior margin of the dorsal. The caudal is furcated, and, like the rest of the fins, rather small. The scales are of medium size, higher than long, with radiating furrows upon their posterior section only, and the lateral line is but slightly deflexed upon the thoracic region. The pharyngeals are moderately expanded upon their convexity. The teeth are of the raptatorial kind, of the hooked type, compressed, without grinding surface, instead of which, a sharp but not serrated ridge. They are arranged upon one single row of four, thus: 4—4.

Syn.—*Codoma*, Grd. Proc. in Acad. Nat. Sc. Philad. VIII, 1856, 194.

The general physiognomy of the genus reminds us of those of *Pimephales* and *Cochlognathus*, with which genera it has no intimate affinities, when the pharyngeal dentition is taken into consideration. Indeed, its affinities with *Cyprinella* and *Moniana* are of a more close character, for, the teeth are constructed upon the same general pattern; from *Cyprinella*, however, it differs by the presence of one single row of teeth, and from *Moniana* by the absence of serratures upon the cutting edge of the teeth, and finally from both *Cyprinella* and *Moniana* by smaller scales, the course of the lateral line, and the short and rounded head.

1. CODOMA ORNATA, Grd.

Plate XXIX, Figs. 22—25.

Spec. Char.—The head, which is short and rounded off, forms the fifth of the total length, whilst the greatest depth enters in the latter but three times and a half. The eye is circular and well developed; its diameter entering somewhat more than three times in the length of the side of the head. The anterior margin of the dorsal is a little nearer the extremity of the snout than the insertion of the caudal fin.

Syn.—*Codoma ornata*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 195.

The coloration is rich and profuse, the upper regions are purplish black, with transverse bands of the same hue from the head to the base of the caudal fin; the space not occupied by these, on the back as well as on the abdomen, is of a golden orange red. The fins are purplish black, edged or tipped with golden yellow or pure white.

D 1, 8; A 1, 7; C 6, 1, 9, 8, 1, 6; V 7; P 12.

Plate XXIX, fig. 22, represents *Codoma ornata*, size of life; fig. 23 is a scale from the dorsal region; fig. 24, a scale from the lateral line; and, fig. 25, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
91	2691	4	Adult.	Chihuahua river and tributaries.....	1855	Jno. Potts, Esq .	Alcoholic.	Jno. Potts, Esq .

2. CODOMA VITTATA, Grd.

Plate XXIX, Figs. 18—21.

Spec. Char.—Has a more elongated body and sub-fusiform outline than the preceding species. The head forms a little less than the fifth of the entire length, whilst the depth enters in it about four times and a half. The eye is much smaller than in *C. ornata*; the fins and scales are smaller also.

Syn.—*Codoma vitalla*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 195.

The upper regions are purplish brown; a silvery band along the middle of the flank; inferiorly yellowish orange. Fins unicolor; the superior ones greyish, the inferior yellowish.

D 1, 8; A 2, 7; C 7, 1, 9, 8, 1, 6; V 7; P 14.

Plate XXIX, fig. 18, represents *Codoma vittata*, size of life; fig. 19 is a dorsal scale; fig. 20, a scale from the lateral line; and, fig. 21, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
92	2692	10	Adult.	Valley of Mexico.....	1855	Jno. Potts, Esq ..	Alcoholic ...	Jno. Potts, Esq ..

1. CYPRINELLA MACROSTOMA, Grd.

Plate XXXI, Figs. 5—8.

This species is very characteristic. The body is deep upon its middle, tapering posteriorly. The head is sub-conical, with a prominent snout and a very large mouth. The eye is well developed. The ventrals are inserted somewhat in advance of the anterior margin of the dorsal fin. The ground color is reddish, with a silvery streak along the middle of the flank, extending likewise over the opercular apparatus.

Syn.—*Cyprinella macrostoma*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 198.

Plate XXXI, fig. 5, represents *Cyprinella macrostoma*, size of life; fig. 6 is a scale from the dorsal region; fig. 7, a scale from the lateral line; and, fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
129	....	3	Adult.	Devil's river, Texas...	1851	Col. J. D. Graham....	Alcoholic.	John H. Clark........
130	2711	3	......	China, New Leon.....	1853	Lt. D. N. Couch	....do....	Lt. D. N. Couch......

2. CYPRINELLA VENUSTA, Grd.

Plate XXXI, Figs. 1—4.

Gracefully compressed and fusiform in profile. The snout protruding and sub-conical. The species is related to *C. macrostoma*, from which it chiefly differs by the relative size of its mouth and shape of the body. The ventrals are likewise inserted somewhat in advance of the anterior margin of the dorsal. Greyish red above, pale beneath; sides silvery. A black patch at the base of the caudal fin.

Syn.—*Cyprinella venusta*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 198.

Plate XXXI, fig. 1, represents *Cyprinella venusta*, size of life; fig. 2 is a dorsal scale; fig. 3, a scale from the dorsal region; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig'l No.	Nature of specimen.	Collected by—
140	2719	15	Adult.	Rio Sabinal, Texas .	1854	Major Emory	119	Alcoholic.	Dr. C. B. Kennerly.

3. CYPRINELLA TEXANA, Grd.

PLATE XXXI, FIGS. 9—12.

Body very slender and fusiform; head small and sub-conical; mouth small; eye large. Ventrals inserted under the anterior margin of the dorsal. Color reddish brown, sides silvery; black dots along the lateral line, terminating into a black spot at the base of the caudal fin.

SYN.—*Cyprinella texana*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 198.

Plate XXXI, fig. 9, represents *Cyprinella texana*, size of life; fig. 10 is a dorsal scale; fig. 11, a scale from the lateral line; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
128	2710	9	Rio Salado, Texas......	1851	Col. J. D. Graham......	Alcoholic.	John H. Clark ....
127	....	1	Turkey creek, Texas....	1851	........do..............	....do....	........do..............

4. CYPRINELLA LUXILOIDES, Grd.

PLATE XXXI, FIGS. 13—16.

At first sight this species, in its general aspect, remind us of certain species of *Luxilus:* The body being deep, gradually tapering away forwards and backwards. The head is well developed and the mouth also. Ventrals inserted slightly in advance of the dorsal. The scales are quite narrow and deep. Reddish brown above; silvery beneath.

SYN.—*Cyprinella luxiloides*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 198.

Plate XXXI, fig. 13, represents *Cyprinella luxiloides*, size of life; fig. 14 is a dorsal scale; fig. 15, a scale from the lateral line; and, fig. 16, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Orig. No.	Nature of specimen.	Collected by—
131	2	Adult.	San Pedro creek, trib. of Rio San Antonio, Tex.	1854	Major Emory	108 109	Alcoholic.	Dr. C. B. Kennerly...

1. MONIANA AURATA, Grd.

PLATE XXX, FIGS. 13—16.

A most handsome species, with a rather deep body gradually tapering posteriorly, and a rounded and sub-truncated head bearing minute spines upon its upper surface. The eye is proportionally small, and the mouth of medium size. Chestnut brown above; a diffused blackish streak along the middle of the flanks; golden beneath.

SYN.—*Moniana aurata*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 200.

Plate XXX, fig. 13, represents *Moniana aurata*, size of life; fig. 14 is a scale from the dorsal region; fig. 15, a scale from the lateral line; and, fig. 16, a scale from the abdominal region.

List of specimens.

Catal. No.	Corresponding No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
118	2703	20	Adult.	Piedra Painte, N.M.	1851	Col. J. D. Graham..	Alcoholic.	John H. Clark.......

2. MONIANA COMPLANATA, Grd.

PLATE XXXI, FIGS. 17—20.

The most compressed of all the species so far known. The profile is regular; the peduncle of the tail rather slender. The total length is two inches and a half, the head entering in it five times and a half. The mouth and eye are of but moderate size. Scales large and very deciduous. Pale red above, silvery on the sides, and yellowish beneath.

SYN.—*Moniana complanata*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 200.

Plate XXXI, fig. 17, represents *Moniana complanata*, size of life; fig. 18 is a dorsal scale; fig. 19, a scale from the lateral line; and, fig. 20, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
94	2694	3	Brownsville, Texas........	1852	Capt. Van Vliet....	Alcoholic....	Capt. Van Vliet....

3. MONIANA FRIGIDA, Grd.

PLATE XXX, FIGS. 17—20.

This species is a little more than three inches in total length, and stands next to the largest of the hitherto known species. The head forms about the fifth of the length. The body is rather deep and very much compressed; the caudal fin deeply furcated. The eye is circular, and its diameter contained four times in the length of the side of the head.

The rays of the fins are:

D 2, 8; A 2, 8; C 6, 1, 9, 8, 1, 6; V 8; P 13.

The color is of a reddish brown tint above; silvery white beneath. The middle of the flanks exhibits an indistinct or rather diffused silvery, sometimes blackish band.

Syn.—*Moniana frigida*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 200.

Plate XXX, fig. 17, represents *Moniana frigida*, size of life; fig. 18, a dorsal scale; fig. 19, a scale from the lateral line; fig. 20, a scale from the abdominal region.

List of specimens.

Catal. No.	Corres. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
100	2696	3	Adult.	Rio Salado, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark.
123		100	do	do	1851	do	do	do
98		10	do	Rio Sabinal, Texas	1851	do	do	do
124	2707	20	do	Rio Medina, Texas	1851	do	do	do

4. MONIANA COUCHI, Grd.

Plate XXX, Figs. 21—24.

Resembles *M. gracilis* most; is, however, distinguished from it by a less fusiform body and a much shorter head. This feature may be traced upon series of specimens of both species with an unfailing constancy. The eye is also smaller, and so is the mouth, as might be deduced from the traits just alluded to.

Syn.—*Moniana couchi*, Grd. in Proc. Acad. Nat. Sc. Philad., VIII, 1856, 201.

Plate XXX, fig. 21, represents *Moniana couchi*, size of life; fig. 22, a dorsal scale; fig. 23, a scale from the lateral line; fig. 24, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
103	2699	20	Adult.	China, New Leon, Mexico.	1853	Lt. D. N. Couch	Alcoholic	Lt. D. N. Couch

5. MONIANA RUTILA, Grd.

Plate XXX, Figs. 1—4.

Has the general physiognomy of *M. gracilis*, from which it differs by a more advanced position of the dorsal fin, and by larger scales. Dorsal region greyish; sides and abdomen golden.

Syn.—*Moniana rutila*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 201.

Plate XXX, fig. 1, represents *Moniana rutila*, size of life; fig. 2, a dorsal scale; fig. 3, a scale from the lateral line; fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
95	2698	10	Adult.	Cadereita, New Leon, Mexico.	1853	Lieut. D. N. Couch...	Alcoholic.	Lieut. D. N. Couch.

6. MONIANA NITIDA, Grd.

This species differs from *M. couchi* by a more elongated and fusiform body, more elongated head, and much larger eye. From *M. rutila* it differs by the same characters of the body, but the head differs by the flattening of its upper surface. There are eleven longitudinal rows of scales upon the line of greatest depth of the body, five above and five below the lateral line. The latter, therefore, is nearly median, forming but a slight curve upon the middle of the abdomen. Color pale red; sides of head and middle of the flanks silvery.

Syn.—*Moniana nitida*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 201.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
96	2695	2	Cadereita, New Leon, Mex.	1853	Lt. D. N. Couch.....	Alcoholic.	Lieut. Couch......

7. MONIANA FORMOSA, Grd.

Plate XXX, Figs. 5—8.

The prettiest species of the genus; the body is fusiform in profile and the tail very much tapering. The region above the lateral line is blackish brown in the adult, and reddish brown in the young, occasionally also dotted with black; the inferior regions are reddish yellow anteriorly and yellowish red posteriorly.

Syn.—*Moniana formosa*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 201.

Plate XXX, fig. 5, represents *Moniana formosa*, size of life; fig. 6 is a dorsal scale; fig. 7, a scale from the lateral line; fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
113 114	2700	4 20	Rio Mimbres, Mexico	1854	Major Emory........	Alcoholic.	Dr. C. B. Kennerly ..

8. MONIANA GRACILIS, Grd.

A very graceful and slender species, resembling most *M. lutrensis*, from which it, however, differs by a much smaller head and a more arched back ; the body itself being more compact. Ash grey above, yellowish white beneath ; flanks silvery.

Syn.—*Moniana gracilis*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 201.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
116	7	Acapulco, near Monterey, New Leon	1853	Lt. D. N. Couch	Alcoholic.	Lieut. Couch

9. MONIANA GIBBOSA, Grd.

Plate XXX, Figs. 9—12.

May readily be distinguished from all its congeners by a short and arched body, resembling a *Cyprinodon* as much as any fish we might compare it to. Pale reddish above; whitish beneath; sides silvery.

Syn.—*Moniana gibbosa*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 201.

Plate XXX, fig. 9, represents *Moniana gibbosa*, size of life ; fig. 10 is a dorsal scale ; fig. 11, a scale from the lateral line ; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
105	3	Brownsville, Texas	1852	Captain Van Vliet	Alcoholic.	Captain Van Vliet

10. MONIANA PROSERPINA, Grd.

Is remarkable for its slender body, sub-conical head, and very small mouth. The eye is of moderate development. The total length is two inches and a quarter, the head constituting the fifth part of it. Eleven rows of scales may be counted upon the line of greatest depth of the body. Greyish brown above ; metallic greyish white upon the sides and beneath.

Syn.—*Moniana proserpina*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 200.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
117	2702	10	Adult	Devil's river, Texas	1851	Col. J. D. Graham	Alcoholic.	John H. Clark

LUXILUS LEPTOSOMUS, Grd.

PLATE XIX, FIGS. 9—12.

SPEC. CHAR.—Outline regularly sub-fusiform; the depth forming a little more than the fifth of the entire length. The head enters five times and a half in the latter dimension. The anal fin is a great deal larger than the dorsal.

SYN.—*Luxilus leptosomus*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 203.

The scales are larger than in any other species of the same genus; they are about as deep as long, anteriorly uneven, posteriorly rounded, with radiating furrows upon their posterior section alone.

D 9; A 2, 13; C 5, 1, 9, 8, 1, 5; V 9; P 15.

Color greyish brown above; light reddish beneath; sides silvery. Edge of the furcated portion of the caudal, blackish grey.

Plate XIX, fig. 9, represents *Luxilus leptosomus*, size of life; fig. 10 is a scale from the dorsal region; fig. 11, a scale from the lateral line; and, fig. 12, a scale from the abdominal region. (The scales are represented in a reversed position.)

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
61	1	Adult.	Dry creek, near Victoria, Tex.	1854	Maj. Emory --------	Alcoholic.	D. C B. Kennerly----

TIAROGA, Girard.

GEN. CHAR.—Head small, sub-conical, depressed. Mouth obliquely terminal, of moderate size, and without barbels of any kind. Upper jaw slightly longer than the lower. Eye of medium size. Isthmus very wide. Body slender, sub-fusiform, compressed. Fins are well developed; dorsal and anal narrow and high; caudal furcated. The insertion of the ventrals takes place in advance the anterior margin of the dorsal. The scales are small, deeper than long, with radiating furrows all around; the lateral line is median. The pharyngeals are similar to those in *Gobio*. The teeth are likewise of the same character: slender, sub-cylindrical upon their base, compressed upwards, of the raptatorial kind, of the hooked type, without grinding surface, and disposed upon a double row of one and three, thus: 1 | 3—3 | 1.

SYN.—*Tiaroga*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 204.

This genus bears some analogy to the Gudgeons (*Gobio*), differing from them by the absence of barbels, either maxillar or buccal, and by a less prominent snout.

TIAROGA COBITIS, Grd.

PLATE XXVIII, FIGS. 11—14.

SPEC. CHAR.—Two inches and a half in total length, the head forming about the fifth part of it. Eyes approximating the upper surface of the head, which is rounded.

SYN.—*Tiaroga cobitis*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 204.

The scales are deeper than long, elliptical, with wide radiating pericentrical furrows.

D 2, 8 + 1; A 1, 7 + 1; C 6, 1, 9, 8, 1, 5; V 8; P 15.

The upper regions are brownish, with small blackish spots; the inferior regions are unicolor of a yellowish tint. A black spot upon the base of the caudal fin.

Plate XXVIII, fig. 11, represents *Tiaroga cobitis*, size of life; fig. 12 is a scale from the dorsal region; fig. 13, a scale from the lateral line; fig. 14, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of spec.	Collected by—
155	2731	10	Rio San Pedro, trib. of Gila	1851	Col. J. D. Graham	Alcoholic.	Jno. H. Clark

1. GILA ELEGANS, B. & G.

Spec. Char.—Body very slender and caudal region very much attenuated. Head very much depressed, constituting about the fifth of the total length; eyes elliptical, their diameter entering seven times in the length of the side of the head. Posterior extremity of maxillar bone extending to a vertical line drawn in advance of the orbit. Isthmus very small. Fins very much developed. Scales sub-elliptical, narrower posteriorly than anteriorly; radiating furrows few and obsoletely developed. Color uniform reddish brown above, yellowish silver beneath; fins dull yellow.

Syn.—*Gila elegans*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 369; and, in *Sitgr*. Rep. Exped. Zuñi and Color. Riv. 1853, 149; Fishes, pl. ii.—Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 205.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
250	1	Colorado river, Cal	1854	Major Emory	Alcoholic.	Arthur Schott

2. GILA GRAHAMI, B. & G.

Plate XXIV, Figs. 7—12.

Spec. Char.—Body sub-fusiform, compressed; head entering about four times and a half in the total length. Posterior extremity of maxillar bone extending to a vertical line drawn across the anterior rim of the orbit. Anterior margin of dorsal fin somewhat nearer the insertion of the caudal than the extremity of the snout; anterior margin of anal situated posteriorly to the dorsal. Caudal strong and deeply furcated.

Syn.—*Gila grahamii*, B. &. G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 389.—Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 205.

The disposition and structure of the scales will be better understood by comparing the figure of this species with those of the following one. The rays of the fins are:

D 2, 10; A 2, 10; C 10, 1, 9, 8, 1, 10; V 1, 10; P 17.

The upper surface of the head and the dorsal region are reddish brown; the upper half of the flanks greyish brown, and the lower half greyish yellow. The abdomen is dull yellowish. A metallic reflect prevailing all over the body. The fins being unicolor, of the tint of the region to which each of them belongs.

Plate XXIV, fig. 7, represents *Gila grahami*, somewhat reduced in size; fig. 8 is the head seen from beneath, showing the outline of the mouth; fig. 9, the head seen from above; fig. 10, a scale from the dorsal region; fig. 11, a scale from the lateral line; and, fig. 12, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
252	2801	6	Adult.	Rio San Pedro, trib. of Rio Gila	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark....
253	2802	1	..do..	..........do............	1851	........do............	....do....	......do..........

3. GILA EMORII, B. & G.

PLATE XXXIII, FIGS. 5—10.

SPEC. CHAR.—Body elongated, compressed. Profile of head continuous with that of the body, and gradually tapering from the nape to the snout. Head forming the fifth of the entire length. Mouth nearly terminal, though inferior still: the upper jaw overlapping the lower one of the thickness of the lip; the posterior extremity of the maxillar bone not extending as far as the anterior rim of the orbit. Eyes circular, of medium size. Anterior margin of dorsal fin nearer the extremity of the snout than the insertion of the caudal; anterior margin of anal fin nearly opposite the posterior margin of the dorsal. Caudal fin deeply furcated and slender. The extremity of the ventrals not extending to the anterior edge of the anal. The pectorals are lanceolated, their extremity not reaching the insertion of the ventrals.

SYN.—*Gila emorii*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 388.—GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 205.

The scales are small, elongated, sub-elliptical or sub-quadrangular, longer than deep, affecting a curious arrangement (see fig. 5). The lateral line undergoes a slight deflection along the middle of the flanks.

Color uniform silvery, with a rather greyish tint along the upper regions.

Plate XXXIII, fig. 5, represents *Gila emorii*, size of life; fig. 6 is the head from beneath, showing the outline of the mouth; fig. 7, the head seen from above; fig. 8, a dorsal scale; fig. 9, a scale from the lateral line; and, fig. 10, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
247	1	Near the mouth of Gila river....	1849	Major Emory......	Alcoholic.	Dr. Jno. L. Leconte....

1. TIGOMA PULCHELLA, Grd.

PLATE XXXIV, FIGS. 5—8.

SPEC. CHAR.—The head is contained four times and a half in the total length. The mouth is small; the posterior extremity of the maxillar bone not extending as far as the anterior rim of the orbit. Diameter of the eye entering five times and a half in the length of the side of the head. The greatest depth of the body is contained about five times in the total length, of which the caudal fin forms the sixth part. Two rudimentary rays at the anterior margin of the dorsal fin instead of one.

SYN.—*Gila pulchella*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 29
Tigoma pulchella, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 206.

The scales are sub-elliptical, sometimes irregularly so, with radiating furrows upon their posterior section alone; the lateral line being very much deflexed upon the middle of the flanks.

D 2, 9; A 1, 9; C 4, 1, 9, 8, 1, 3; V 9; P 17.

The color is greyish brown above and laterally ; dingy yellow beneath.

Plate XXXIV, fig. 5, represents *Tigoma pulchella*, size of life ; fig. 6 is a scale from the dorsal region ; fig. 7, a scale from the lateral line ; fig. 8, a scale from the abdominal region

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
233	2787	2	Rio Mimbres, tributary of Lake Guzman, Mexico.	1851	Col J. D. Graham.	Alcoholic . .	John H. Clark . . .

2. TIGOMA PURPUREA, Grd.

This is a much stouter fish than *T. pulchella*, which it resembles in other respects ; but its head is larger and its body shorter. The anterior margin of the dorsal is nearer the extremity of the caudal than the tip of the snout, whilst in *T. pulchella* it is nearer to the snout than the extremity of the caudal. The scales are also larger than in *T. pulchella*. The color is of purplish black on the dorsal region and laterally ; beneath yellowish.

SYN.—*Tigoma purpurea*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 206.

List of specimens.

Catal. No.	Cor. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
224	2778	15	San Bernardino, Rio Huagui, west of the Sierra Madre.	1854	Major Emory	Alcoholic.	Dr. C. B. Kennerly . . . .

3. TIGOMA INTERMEDIA, Grd.

Intermediate between *T. pulchella* and *T. purpurea*, more closely related, however, to the former than to the latter. The fins are much less developed, the inferior fins especially are quite small.

SYN.—*Tigoma intermedia*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 206.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
232	2786	20	Rio San Pedro, tributary of the Gila . .	1851	Col. J. D. Graham . .	Alcoholic.	Jno. H. Clark . .

4. TIGOMA GIBBOSA, Grd.

Plate XXXIII, Figs. 1—4.

Spec. Char.—Body rather thick ; dorsal region between dorsal fin and occiput more arched than generally observed in this genus. Head forming a little less than the fourth of the entire length ; greatest depth nearly equal to the length of head. Eyes quite large ; their diameter contained five times in the length of the side of head. Anterior margin and dorsal fin nearer the base of caudal than the tip of snout. Ventrals, as usual, in advance of the dorsal, and anal behind the latter. Greatest length of caudal fin constituting nearly the seventh of the entire length.

Syn.—*Gila gibbosa*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 28.
Tigoma gibbosa, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 207.

The scales, irregularly sub-elliptical, are longer than deep, and exhibit radiating furrows upon their entire periphery.

D 1, 8 + 1 ; A 1, 9 ; C 5, 1, 9, 8, 1, 4 ; V 9 ; P 17.

Color in alcohol, dark reddish brown above and laterally ; dull yellow beneath.

Plate XXXIII, fig. 1, represents *Tigoma gibbosa*, size of life ; fig. 2 being a scale from the dorsal region ; fig. 3, a scale from the lateral line ; and, fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
223	2776	15	Rio Santa Cruz, Mex	1851	Col. J. D. Graham	Alcoholic.	Jno. H. Clark
222	2775	10	Tuscon, Sonora		Lt. J. G. Parke	do	Dr. A. L. Heermann.

5. TIGOMA NIGRESCENS, Grd.

Plate XXXII, Figs. 1—4.

This is quite an elegant species, being elongated and slender, like *T. pulchella* and *T. gracilis.* It differs from *T. gibbosa* by a more conical head and snout. The ground color is yellowish, the middle of the scales being covered with crowded black dots, the back and sides appearing almost black. The belly is unicolor. In the young the upper regions are lighter than in the adult.

Syn.—*Tigoma nigrescens*, Grd. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 207.

Plate XXXII, fig. 1, represents *Tigoma nigrescens*, size of life ; fig. 2, a dorsal scale ; fig. 3, a scale from the lateral line ; fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No. of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
220	2774	10	Boca Grande	1854	Maj. Emory	Alcoholic.	Dr. C. B. Kennerly
219		1	Janos river	1854	do	do	do

6. TIGOMA PULCHRA, Grd.

PLATE XXXII, FIGS. 5—8.

The body is gracefully elongated, in which respect it resembles *T. nigrescens*, from which it may be distinguished by its smaller head and larger scales. The color, moreover, is of a far more brilliant type: the dorsal region is reddish or blackish brown, the sides and belly, of a uniform golden yellow; a diffused black streak may occasionally be seen along the upper portion of the flanks, very likely more predominant in the male than in the female.

SYN.—*Tigoma pulchra*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 207.

Plate XXXII, fig. 5, represents *Tigoma pulchra*, size of life; fig. 6, a dorsal scale; fig. 7, a scale from the lateral line; fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimens.	Collected by—
227	2781	3	Chihuahua river and tributaries	1855	John Potts, Esq	Alcoholic	John Potts, Esq
228	2782	4	do do	1855	do	do	do

PTYCHOCHEILUS LUCIUS, Grd.

PLATE XXXIV, FIGS. 1—4.

A very characteristic species. The body is compressed, but the head is flattened or depressed and very much developed, constituting nearly the fourth of the entire length. The dorsal and ventrals are situated quite posteriorly. The scales are below the medium size, and the lateral line is deflexed upon the abdomen. The pharyngeal bones are very slender; the inferior limb is almost exiguous and proportionally as long as in *P. grandis*. There are, however, but four teeth upon the main row, instead of five, as in the case of *P. grandis*. Color bluish grey above; silvery golden beneath.

SYN.—*Ptychocheilus lucius*, GRD. in Proc. Acad. Nat. Sc. Philad. VIII, 1856, 209.

Plate XXXIV, fig. 1, represents *Ptychocheilus lucius*, size of life; fig. 2 is a scale from the dorsal region; fig. 3, a scale from the lateral line; fig. 4, a scale from the abdominal region.

List of specimens.

Catal. No.	Cor. No of teeth.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
203	2757	1	Rio Colorado, Cal	1854	Major Emory	Alcoholic	Arthur Schott

Family CYPRINODONTIDAE.

CYPRINODON, Lacép.

The genus *Cyprinodon* is composed of small fishes, more or less sub-elliptical in their general appearance, with no other differences between the sexes, except that in the female the body is occasionally more elongated than in the male, and approaching to a sub-fusiform shape. The position and shape of the fins are nearly alike, the dorsal alone being somewhat higher in the male than in the female, without, however, approaching to anything like that of *Poecilia*. The caudal is sub-truncated upon its posterior margin. The ventrals are small. The head is rather well developed and anteriorly rounded off. The teeth are elongated, broadest at the crown, which is trilobed. The gill apertures are continuous under the throat.

These fishes inhabit the brackish waters, and are especially numerous in the warm region of the temperate zone.

1. CYPRINODON ELEGANS, B. & G.

Plate XXXVII, Figs. 1—7.

Spec. Char.—The general form differs according to the sexes; it being sub-fusiform in the female and sub-elliptical in the male. The head constitutes about the fourth of the total length. The diameter of the eye enters about four times in the sides of the head. The dorsal fin is longer than high; its anterior margin being equidistant between the extremity of the snout and the base of the caudal; its upper margin rounded off. The caudal, which forms about the seventh of the total length, is posteriorly sub-truncated. The origin of the ventrals is situated opposite the anterior margin of the dorsal fin.

Syn.—*Cyprinodon elegans*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 389.

The dorsal region is deep bluish black, the sides of the body being variegated with bluish black and olive. The posterior edge of the caudal fin is black in the male. A black spot, more conspicuous in the female than in the male, may be observed at the posterior margin of the dorsal fin.

D 11; A 10; C 3, 1, 8, 8, 1, 2; V 6; P 14.

Plate XXXVII, fig. 1, represents the female sex of *Cyprinodon elegans*, size of life. Fig. 2 is an outline from above. Fig. 3, a section across the region of greatest depth. Fig. 4, the male sex of the same species, also size of life. Fig. 5, its teeth. Fig. 6, an outline from above. Fig. 7, a transverse section.

List of specimens.

Catal. No.	No. of spec.	Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
686	21	♂	Camanche Springs, Rio Grande del Norte (Rio Bravo).	1851	Col. J. D. Graham	Alcoholic	John H. Clark
687	11	♀	do	1851	do	do	do

2. CYPRINODON GIBBOSUS, B. & G.

PLATE XXXVIII, FIGS. 1—7.

SPEC. CHAR.—General form sub-elliptical, the dorsal region arched in both sexes. The nape often depressed or sub-concave. The head is rather small, entering four times and a half in the total length. The eye is large; its diameter is a little more than the third of the side of the head. The dorsal fin of the male is higher than long, that of the female somewhat longer than high. The caudal is sub-truncated posteriorly, and enters about six times and a half in the total length. The anal fin is less deep and more rounded exteriorly than in *C. elegans*. The origin of the ventrals is likewise placed somewhat more posteriorly with reference to the anterior margin of the dorsal. The pectorals are more elongated also than in the latter species.

SYN.—*Cyprinodon gibbosus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 390.

The dorsal region, the head, and dorsal fin are of a uniform bluish black in the male; the ventral region is golden yellow. The caudal fin is posteriorly margined with black; the anal, ventrals, and pectorals being yellow. The female exhibits vertical bars of black on the side of the body. The fins are unicolor, except the dorsal, which is provided posteriorly with a black patch.

D 10; A 11; C 4, 1, 8, 7, 1, 3; V 5; P 15.

Plate XXXVIII, fig. 1, represents the male sex of *Cyprinodon gibbosus*, size of life. Fig. 2 exhibits its teeth. Fig. 3, an outline from above. Fig. 4, a section of the body. Fig. 5 is the female sex, also size of life. Fig. 6, an outline from above. Fig. 7, a section of the body.

List of specimens.

Catal. No.	No. of spec	Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
684	15	♂	Indianola, Texas	1851	Col. J. D Graham	Alcoholic	John H. Clark
685	10	♀	do	1851	do	do	do

3. CYPRINODON BOVINUS, B. & G.

PLATE XXXVII, FIGS. 12—18.

SPEC. CHAR.—General form sub-elliptical; dorsal region arched in both sexes. Head rather large, constituting the third of the length, the caudal fin excluded. The eye is moderate sized; its diameter entering four times in the length of the side of the head. The anterior margin of the dorsal fin is equidistant between the extremity of the snout and the insertion of the caudal fin; it is higher than long in the male, and longer than high in the female. The caudal, which enters seven times in the total length, is sub-truncated posteriorly. The anal is shorter than in *C. elegans*, and inserted somewhat more backwards. The origin of the ventrals is placed opposite the anterior margin of the dorsal fin.

SYN.—*Cyprinodon bovinus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 389.

The male is uniform blackish brown above, olivaceous beneath; the fins being unicolor, except the caudal, which has its posterior margin black. The female has the lower portion of the flank irregularly maculated; the fins being unicolor also, except the dorsal, which exhibits a black spot at its posterior margin.

D 9; A 8; C 6, 1, 7, 6, 1, 5; V 6; P 14.

Plate XXXVII, fig. 12, represents the male sex of *Cyprinodon bovinus*, size of life. Fig. 13, its teeth. Fig. 14, an outline from above. Fig. 15, a section of the body. Fig. 16, the female sex of the same species. Fig. 17, a section of the body. Fig. 18, an outline from above.

List of specimens.

Catal. No.	No. of spec.	Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
682	10	♂	Leon's Spring, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark
683	6	♀	do	1851	do	do	do

4. CYPRINODON MACULARIUS, B. & G.

Plate XXXVII, Figs. 8—11.

Spec. Char.—The head constitutes one-fourth of the entire length. The eye is moderate; its diameter entering four times in the length of the side of the head. The dorsal fin in the female is as long as high, its anterior margin being somewhat nearer the insertion of the caudal than the extremity of the snout; its base enters six times in the total length. The caudal is posteriorly sub-convex, and is contained nearly six times and a half in the total length. The anal is narrower, though deeper, than the dorsal. The ventrals being very small, and inserted somewhat anteriorly to the dorsal fin.

Syn.—*Cyprinodon macularius*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 389.

The color above is reddish brown, yellowish beneath, maculated with black; the spots on the sides having a tendency to arrange themselves into vertical bands. Dorsal blackish; the other fins dull yellow, greyish at their base.

D 8; A 10; C 3, 1, 7, 6, 1, 2; V 7; P 12.

Plate XXXVII, fig. 8, represents the female sex of *Cyprinodon macularius*, size of life. Fig. 9, its teeth. Fig. 10, an outline from above. Fig. 11, a section of the body.

List of specimens.

Catal. No.	No. of spec.	Sex.	Locality.	When collected	Whence obtained.	Nature of specimen.	Collected by—
992	8	♀	Rio San Pedro (Rio Gila)	1851	Col. J. D. Graham	Alcoholic	Jno. H. Clark

HYDRARGYRA SIMILIS, B. & G.

Plate XXXV, Figs. 1—8.

Spec. Char.—Body elongated and sub-fusiform. Head sub-conical in profile, constituting somewhat more than the fourth of the total length. Diameter of the eye entering five times in the side of the head. Dorsal fin higher than long, its base being contained about nine times in the total length. The caudal fin, posteriorly sub-truncated, constitutes about the seventh of the total length. Anal narrow and deep, its central rays, in the male, more elongated than in the female. Ventrals rather small. Pectorals of moderate development. Scales about as deep as long, anteriorly sub concave, posteriorly convex, with a few radiating furrows upon their anterior section alone.

Syn.—*Hydrargyra similis*, B. & G. in Proc. Acad. Nat. Sc. Philad VI, 1853, 389.

The back is bluish grey, the sides and abdomen yellowish. Transverse black bars in both sexes. Fins unicolor in the female; the dorsal fin of the male exhibiting a black spot at its posterior margin.

D 11; A 8; C 3, 1, 8, 7, 1, 2; V 5; P 18.

Plate XXXV, fig. 1, represents *Hydrargyra similis*, size of life. Fig. 2, an outline from above. Fig. 3, a dorsal scale. Fig. 4, an abdominal scale. Fig. 5, is the male sex of the same species, also size of life. Fig. 6, an outline from above. Fig. 7, a dorsal scale. Fig. 8, a scale from the abdominal region.

List of specimens.

Catal. No.	No of spec.	Age & Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
651	12	Adult ♂ & ♀	Indianola, Texas........	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark...

FUNDULUS GRANDIS, B. & G.

PLATE XXXVI.

SPEC. CHAR.—The body is rather plump, its greatest thickness being somewhat more in the male and somewhat less in the female than the fourth of the total length, in which the head enters about four times. Scales on the occiput and opercular apparatus very large. Diameter of the eye entering about five times in the side of the head. Caudal posteriorly rounded. Anal inserted under the posterior portion of the base of the dorsal, the tips of the rays of both these fins being nearly even: they are more elongated in the male than in the female.

SYN.—*Fundulus grandis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 389.

The dorsal region is bluish black; the sides greyish, with yellow spots. Beneath dull yellow. Dorsal and caudal fins in the male deep metallic black, yellow spotted, external margin yellow; other fins yellowish; base of anal also spotted. Body and fins in the female unicolor.

D 11; A 12; C 2, 1, 9, 9, 1, 2; V 7; P 18.

Plate XXXVI, fig. 1, represents the female sex of *Fundulus grandis*, size of life. Fig. 2, an outline from above. Fig. 3, a dorsal scale. Fig. 4, an abdominal scale. Fig. 5 is the male sex of the same species, also size of life. Fig. 6, an outline from above. Fig. 7, a dorsal scale. Fig. 8, an abdominal scale.

List of specimens.

Catal. No.	No. of spec.	Sex and age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
650	5	Adult ♂ & ♀	Indianola, Texas........	1851	Col. J. D. Graham....	Alcoholic.	Jno. H. Clark...

POECILIA, Schn.

It having been ascertained that *Mollinesia* is the female sex of *Poecilia*, the species hitherto described under these two heads must necessarily come under that of *Poecilia* alone, which has priority. Much is yet left undone as to the natural history of these fishes.

The genus *Poecilia* is closely related to *Limia* of Poey, from which it differs by a more backward position of the anal and ventral fins as compared to the dorsal. The latter, in the male sex, acquiring likewise a development which it never reaches in *Limia*. The anal fin, moreover, has the same structure in both sexes, and which is not the case in *Limia*.

POECILIA LINEOLATA, Grd.

PLATE XXXV, FIGS. 9—11.

SPEC. CHAR.—Head rather small and acute, entering four times and a half in the total length. The diameter of the eye is contained about four times in the side of the head: once in advance of the anterior rim of the orbit. Dorsal fin in the female longer than high, its anterior margin nearer the extremity of the snout than the insertion of the caudal, and its base equal to the length of the head. The caudal, which is posteriorly rounded off, enters four times and a half in the total length. The anal is small, inserted opposite the posterior third of the base of the dorsal. The insertion of the small ventrals takes place in advance of the anterior margin of the dorsal fin. The scales are much deeper than long.

The color is olivaceous or reddish brown, with seven longitudinal series of black spots occupying the centre of the scales. Dorsal and anal fins with transverse black filets; other fins unicolor.

D 14; A 7; C 5, 1, 8, 8, 1, 4; V 6; P 12.

Plate XXXV, fig. 9, represents the female sex of *Poecilia lineolata*, size of life. Fig. 10, a dorsal scale. Fig. 11, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Sex and Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
667	3	♀ Adult	Brownsville, Texas.....	1853	Capt. Van Vliet.......	Alcoholic.	Capt. Van Vliet.....
668	4	♀	Fort Brown, Texas......	1853	Major Emory..........	...do	Jno. H. Clark......

LIMIA, Poey.

The external row of acerated and incurved teeth, and the narrow band of velvet-like ones which may be observed upon the jaws, are characters common to *Poecilia* as well as to *Limia*. The caudal fin is likewise rounded off posteriorly in both the genera just alluded to. But whilst the male sex of *Poecilia* differs from its female by an extraordinary development of the dorsal fin, the male sex of *Limia* is distinguishable from its female by a narrower and much more elongated anal fin. The ventral fins, in *Limia*, are inserted in advance of the anterior margin of the dorsal, whilst the anal remains in a more backward position, with its posterior margin projecting beyond that of the dorsal fin.

1. LIMIA POECILOIDES, Grd.

PLATE XXXVIII, FIGS. 8—14.

SPEC. CHAR.—Body very much compressed, rather deep upon its middle; the head constituting about the fourth of the total length, the proportions varying somewhat, according to the sexes. The teeth of the external row are very slender and exiguous. The dorsal fin is larger in the male than in the female; its anterior margin is nearer the extremity of the snout than the posterior edge of the caudal, which is convex. The anal fin, in the female, is larger than the dorsal, and inserted posteriorly to the latter; whilst in the male the same is situated opposite the middle region of the dorsal. The ventrals are very small in both sexes, and inserted in advance of the anterior margin of the dorsal. The pectorals are rather short and broad.

The color is reddish brown, apparently uniform in the female, whilst the male exhibits transverse fascia of a darker hue, and a small blackish spot at the base of each scale, constituting about seven longitudinal series on either side of the body. The dorsal fin is likewise transversely black spotted.

D 13 ; A 6 ; C 2, 1, 7, 7, 1, 2 ; V 5 ; P 13. (Male.)
8 ; 12 ; do ; do ; do . (Female.)

Plate XXXVIII, fig. 8, represents the male sex of *Limia poeciloides*, size of life. Fig. 9, an enlarged front view of the mouth, showing the teeth. Fig. 10, an outline from above. Fig. 11, ideal transverse section across the greatest depth and width. Fig. 12, female sex of the same species, size of life. Fig. 13, an outline from above. Fig. 14, a transverse section.

List of specimens.

Catal. No.	No. of spec.	Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
670	2	♂ ♀	Indianola, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark

2. LIMIA VENUSTA, Grd.

PLATE XXXIX, FIGS. 20—23.

SPEC. CHAR.—The body is gracefully fusiform, elongated, and compressed ; the head forming somewhat less than the fourth of the total length. The teeth of the external row are slender and acute, a good deal larger than in the preceding species, and the snout is thicker and less depressed. The dorsal fin is larger than the anal, and situated more in advance than in the species just alluded to, the same sexes being compared. The shape and position of the other fins do not differ materially in both species, except the pectorals, which are more slender in the present one. The posterior margin of the caudal fin is, as usual, rounded off.

The color is reddish brown, apparently uniform, although traces of black spots or dots seem to have existed at the base of the scales ; but the epidermis being partly removed from the specimens preserved in alcohol, the living ones may exhibit distinct spots.

D 13 ; A 11 ; C 3, 1, 8, 8, 1, 2 ; V 5 ; P 10. (Female.)

Plate XXXIX, fig. 20, represents the female sex of *Limia venusta*, size of life. Fig. 21 is a front view of the mouth, considerably enlarged in order to show the teeth. Fig. 22, an outline from above. Fig. 23, an ideal section across the line of greatest depth and width.

List of specimens.

Catal. No.	No. of spec.	Sex.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
669	1	♀	Indianola, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark

1. GAMBUSIA NOBILIS, Grd.

PLATE XXXIX, FIGS. 8—11.

SPEC. CHAR.—Body rather short and stoutish ; head large, forming about the fourth of the total length. Anterior margin of dorsal fin situated midway between the extremity of the snout and the posterior margin of the caudal. Anal much smaller than the dorsal ; both being comparatively broad and exteriorly rounded. Ventral fins very small ; pectorals moderate sized and rather short.

SYN.—*Heterandria nobilis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 390.

The ground color is dark reddish brown above; lighter beneath: the edge of the scales being margined with black.

D 8; A 7; C 4, 1, 7, 7, 1, 3; V 6; P 10. (Female.)

Plate XXXIX, fig. 8, represents the female sex of *Gambusia nobilis*, size of life. Fig. 9, a front view of its mouth to show the dentition. Fig. 10, outline from above. Fig. 11, an ideal section across the line of greatest depth and width.

List of specimens.

Catal. No.	No. of spec	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
679	6	Leon's Spring, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark
680	1	Camanche Spring, Texas	1851	do	do	do
681	2	Zoquito, Texas	1851	do	do	do

2. GAMBUSIA AFFINIS, Grd.

Plate XXXIX, Figs. 12—15.

Spec. Char.—Body elongated, sub-fusiform, and slender. Head rather small, constituting the fifth of the entire length. The dorsal fin is narrow, its anterior margin somewhat nearer the extremity of the snout than the margin of the caudal fin. Anal like the dorsal in size and shape. Ventrals slender and elongated; pectorals moderate sized and elongated.

Syn.—*Heterandria affinis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 390.

Color yellowish brown above; orange beneath. Fins unicolor, except the dorsal, which exhibits narrow dark cross bands. The caudal is occasionally maculated with black.

D 6; A 8; C 3, 1, 7, 6, 1, 2; V 5; P 12. (Female.)

Plate XXXIX, fig. 12, represents the female sex of *Gambusia affinis*, size of life. Fig. 13, a front view of its mouth, exhibiting the dentition. Fig. 14, an outline from above. Fig. 15, an ideal section across the line of greatest depth and width.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
677	3	Rio Medina, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark
678	1	Rio Salado, Texas	1851	do	do	do

3. GAMBUSIA PATRUELIS, Grd.

Plate XXXIX, Figs. 1—7.

Spec. Char.—Body elongated, sub-fusiform, compressed. Head constituting the fifth of the entire length, although larger than in *G. affinis*. The dorsal fin is somewhat smaller than the anal, and its anterior margin nearer the posterior edge of the caudal than the extremity of the snout. The origin of the anal is placed further in advance of the dorsal than in any of the species of the genus figured on the accompanying plate. The ventrals are rather small, whilst the pectorals are broad and considerably more developed than in the other species.

Syn.—*Heterandria patruelis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 390.

The color is dark reddish brown above; yellowish beneath, with an oblique dark streak across the cheek beneath the orbit. The caudal fin is occasionally barred.

D 7; A 10; C 3, 1, 7, 6, 1, 2; V 6; P 11. (Female.)
Do.; 7; do. ; do.; do. (Male.)

Plate XXXIX, fig. 1, represents the female sex of *Gambusia patruelis*, size of life. Fig. 2, an outline from above. Fig. 3, an ideal section of the body. Fig. 4, the male sex of the same species, size of life. Fig. 5, an enlarged view of its mouth, showing its dentition. Fig. 6, an outline from above. Fig. 7, a cross section of its body.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
672	12	Rio Sabinal, Texas	1851	Col. J. D. Graham	Alcoholic	John H. Clark
673	4	Rio Leona, Texas	1851	do	do	do
674	6	Rio Nueces, Texas	1851	do	do	do
675	3	Elm creek, Texas	1851	do	do	do
676	1	Turkey creek, Texas	1851	do	do	do

GIRARDINUS OCCIDENTALIS, Grd.

PLATE XXXIX, FIGS. 16—19.

SPEC. CHAR.—Body slender and elongated, dorsal region sub-convex. Head rather small and conical, constituting somewhat more than the fifth of the entire length. The dorsal fin is small and narrow; its anterior margin being a little nearer the extremity of the snout than the posterior edge of the caudal fin. The anal resembles the dorsal in size and shape. The ventral fins are very small and short, and the pectorals rather broad and moderate sized.

SYN.—*Heterandria occidentalis*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1853, 390.

The color above is reddish brown; beneath reddish yellow. A black streak may be observed along the ventral line and under the peduncle of the tail. The fins being unicolor, of a light yellowish tint.

D 6; A 7; C 4, 1, 7, 6, 1, 3; V 6; P 10. (Female.)

Plate XXXIX, fig. 16, represents the female sex of *Girardinus occidentalis*, size of life. Fig. 17, a front view of its mouth, magnified, showing the teeth. Fig. 18, an outline from above. Fig. 19, a cross section of the body.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
671	5	Rio Santa Cruz, Mexico	1851	Col. J. D. Graham	Alcoholic	John H. Clark

Family CHARACINIDAE.

The body is scaly, and the majority of the fishes of this family have, in addition to the dorsal fin, an adipose finlet. The upper arcade of the mouth is formed anteriorly by the permaxillars, and sideways by the maxillar bones. The dentition varies greatly according to the genera; the teeth may even be wanting. The pharyngeal bones do not exhibit those large teeth which we have observed amongst Cyprinoids. The air-bladder is divided into an anterior and a posterior partition, as is the case in the Cyprinoids, and there is, in addition, a connecting chain of small bones between the same air-bladder and the organ of audition such as may be observed in both Cyprinoid and Siluroid families. The pseudobranchia are not visibly developed, an organic trait by which these fishes may easily be distinguished from the *Salmonidae*. In such as are provided with an adipose finlet, an oviduct leads the eggs out, not allowing them to fall into the abdominal cavity. The intestine is provided with numerous *cœca*.

ASTYANAX, B. & G.

Gen. Char.—Body compressed; abdomen not serrated. Scales large. Adipose fin present. A double row of teeth on the premaxillaries and anterior portion of the maxillaries. Neither canine nor palatine teeth. Gill apertures continuous under the throat; branchiostegal rays three on either side. Pharyngeal teeth absent, else so minute as not to be perceptible. Dorsal fin situated above the ventrals.

Syn.—*Astyanax*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 26.

The premaxillar teeth have the same structure as those on the lower jaw: Plate VIII, fig. 6, giving a very good idea of what that structure is. The teeth observed at the upper portion of the anterior edge of the maxillar bones are very small, simple, conical, imperceptible to the naked eye.

The species described below, the only one so far known of its genus, is the northernmost representative of the family *Characinidae*, which is thus added to the fauna of the United States of North America.

ASTYANAX ARGENTATUS, B. & G.

Plate VIII, Figs. 5—9.

Spec. Char.—Body rather short, deep, and very much compressed, the head forming about the fifth of the total length. The snout is abbreviated and rounded off; the mouth of medium size, its angles not extending so far back as a vertical line drawn in advance of the pupil. The eye is large and circular; its diameter entering about three times and a half in the length of the side of the head. Opercular apparatus quite narrow. Dorsal fin higher than long, somewhat concave upon its upper margin; its anterior edge being placed midway between the extremity of the snout and the insertion of the caudal fin. Adipose fin quite slender, situated opposite the posterior portion of the anal. Caudal fin deeply furcated and longer than the head. Anal fin longer than deep, exteriorly concave, much deeper anteriorly than posteriorly, and inserted backwards of the dorsal. The ventrals, rather slender, are inserted nearly under the middle of the dorsal. The pectorals, larger than the ventrals, are also slender; their tips, however, do not reach the insertion of the ventrals when stretched in that direction.

Syn.—*Astyanax argentatus*, B. & G. in Proc. Acad. Nat. Sc. Philad. VII, 1854, 27.

The scales are deeper than long, somewhat truncated anteriorly. There are no radiating furrows, but some very well marked stria may be observed upon their posterior section. The lateral line is very conspicuous, and slightly bent downwards upon the middle of the abdomen.

Br. III: 111; D 1, 10; A 1, 21; C 5, 1, 9, 8, 1, 4; V 8; P 13.

The dorsal region is of a deep reddish brown, whilst the sides of the abdomen are of a bright silvery hue; the fins being reddish yellow. An elongated black spot exists at the base of the caudal fin, extending along the central rays to near the posterior edge of that fin.

Plate VIII, fig. 5, represents *Astyanax argentatus*, size of life. Fig. 6 is an enlarged view of the open mouth, in order to show the peculiar shape of the teeth, some of which being represented isolated in *a*, *b*, *c*, and *d*. Fig. 7 is a scale from the dorsal region. Fig. 8, a scale from the lateral line; and, fig. 9, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Age.	Locality.	When collected.	Whence obtained.	Nature of specimen.
869	24	Adt. & y'g.	Rio Nueces, Texas	1851	Col. J. D. Graham	Alcoholic
870	8	----------	Rio Leona, Texas	1851	do	do
871	3	----------	Zoquito, Texas	1851	do	do
872	10	----------	Camanche Springs, Texas	1851	do	do
873	8	----------	Elm creek, Texas	1851	do	do
874	4	----------	Turkey creek, Texas	1851	do	do
875	----------	----------	San Felipe, Texas	1851	do	do
876	2	----------	Devil's river, Texas	1851	do	do
877	36	----------	Brownsville, Texas	1852	Captain Van Vliet	do
878	1	----------	Mouth of Rio Grande (Rio Bravo).	1853	Major Emory	do
879	4	----------	Rio Sabinal, Texas	1854	do	do

Family SCOPELIDAE.

One specimen of SAURUS MEXICANUS was collected by Gustavus Würdemann, along the coast of Texas. It is the only species, so far known, representing this family in the Gulf of Mexico.

Family CLUPEIDAE.

Five species of this family have been gathered at various places along the Gulf of Mexico. Amongst them are two *Engraulis* (anchovies), one *Meletta*, one *Chatoessus*, and one *Clupeonia*. They are chiefly due to the exertions of Captain Van Vliet, John H. Clark, under Major Emory, and Gustavus Würdemann.

Family MURAENIDAE.

These are eel-like fishes, characterized by the absence of ventral fins, and sometimes also by the want of the pectorals themselves. The air-bladder has a communication with the throat through an air-duct, as is the case in the sub-order of *Malacoterygii abdominales*. Pseudobranchia do not exist in this family. The pyloric appendages are wanting. As far as anatomic observations have been traced upon representatives of this family, there seems to be no oviduct: the eggs falling in the abdominal cavity, whence expelled through a postanal aperture.

ANGUILLA TYRANNUS, Grd.

PLATE XL.

SPEC. CHAR.---Head quite depressed; anterior third of body sub-cylindrical, somewhat deeper than wide, compressed upon the rest of its length. The cephalic region measured from the extremity of the lower jaw to the insertion of the pectoral fins, enters about seven times and a half in the total length. The lower jaw is longer than the upper; the gape of the mouth is nearly horizontal; is angle, corresponding to a vertical line drawn inwardly of the posterior rim of the orbit. The eye is well developed and sub-circular; its diameter entering twice upon the distance between its anterior rim and the tip of the lower jaw.

The posterior nostril is large and placed near the eye; the anterior nostril, on the other hand, is very small, situated near the apex of the snout, and exteriorly of which may be seen a short membranous expansion just in advance of the upper lip. The teeth are small, conical, disposed upon a narrow longitudinal band on both jaws and along the vomer also; wider anteriorly than posteriorly where it tapers away. The branchial apertures are small, vertical, situated in advance of the insertion of the pectoral fins. The origin of the dorsal fin corresponds to the anterior third of the total length; the origin of the anal fin is placed somewhat anteriorly to the middle of the entire length. The scales are narrow, elongated, and cellular in structure; and, although imbedded in the skin, they are quite apparent to the naked eye. They are disposed upon small group with their longitudinal diameter in every possible directions, giving the surface of the animal a checkered aspect. They extend over the base of the fins. The upper region is dark olive green; the inferior region being dull yellow or light olive. The periphery of the caudal fin is black.

Plate XL, fig. 1, represents *Anguilla tyrannus*, reduced from a specimen over two feet long. Fig. 2 is a scale from the dorsal region; fig. 3, a scale from the abdominal region.

List of specimens.

Catal. No.	No. of spec.	Sex and age.	Locality.	When collected.	Whence obtained.	Nature of specimen.
857	1	Adult.	Mouth of Rio Grande del Norte (R. Bravo)..	1853	Major Emory	Alcoholic..
858	4	....	Matamoras, Mexico........................	1852	Lieutenant D. N. Couch......	....do.....
859	5	Young..	..........do............................	....	..........do..............	....do.....

NEOMURAENA, Girard,

Gen. Char.—Neither pectoral nor ventral fins; dorsal and anal fins low, uniting into a point posteriorly. Anterior maxillar teeth largest. One series of vomerine teeth. Gill apertures lateral and sub-circular.

NEOMURAENA NIGROMARGINATA, Grd.

Plate XLI.

Spec. Char.—Head rather slender and sub-conical; body compressed and tapering into a point. The mouth is deeply cleft, the jaws being equal, its gape nearly horizontal, and its angle extending considerably beyond the orbit. The maxillar teeth are slender and acute, canine-like, larger anteriorly than posteriorly; a series of short sub-conical ones may be observed upon the middle of the vomer. The eyes are sub-elliptical and of moderate development.

The posterior nostrils, which are also the largest, are situated above the orbits on a line drawn in advance of the pupil; the anterior nostrils being tubular, situated near the apex of the snout and directed forwards. Small mucous pores may be observed on the upper surface as well as on the sides of the head. The dorsal fin commences anterior to the branchial apertures, which are sub-circular and rather small. The vent is placed anterior to the middle of the total length, where the anal fin is reduced to a mere membranous ridge. The scales are so minute and imperceptible that the body appears as though perfectly smooth. The lateral line is likewise inconspicuous.

The ground color is reddish brown, darker above than below, with whitish dots scattered all over the body and fins; the dorsal fin is black, margined with a series of black spots; the anal being entirely black or purplish black.

Plate XLI represents *Neomuraena nigromarginata,* size of life. The outlines beneath the main figure are transverse sections of the body and tail.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
860	1	St. Joseph's island, Texas...	1853	Gust. Würdemann......	Alcoholic.	Gust. Würdemann.....

NEOCONGER, Girard.

Gen. Char.—Pectoral fins present; dorsal and anal fins mostly reduced to a membranous ridge, uniting with the caudal, where they are better developed. Snout tapering; lower jaw shorter than the upper; maxillar teeth exiguous, disposed upon multiple series. A patch of similar teeth on the front of the vomer, and one series along its median line. Gill apertures lateral, rather large and vertical.

NEOCONGER MUCRONATUS, Grd.

Spec Char.—The largest specimens observed are about twelve inches in total length. The head is small, slender, narrow, and pointed; the upper jaw projecting beyond the lower. The gape of the mouth is horizontal, its angles extending beyond the orbits. The eyes are very small, sub-elliptical.

The posterior nasal aperture is placed near the anterior rim of the orbit, whilst the anterior one is situated on the side and near the apex of the rostrum. The vent is situated somewhat nearer the extremity of the snout than the posterior edge of the caudal fin. The dorsal fin commences a little way in advance of the vent, and, like the anal fin, it constitutes a mere membranous ridge until about an inch and a half from the posterior extremity of the body, where it expands, fin-like, and unites with the anal. The pectorals are small, sub-elliptical in their outline, and broad at their base.

The color is dark reddish brown above; light reddish or dull white beneath.

List of specimens.

Catal. No.	No. of spec.	Locality.	When collected.	Whence obtained.	Nature of specimen.	Collected by—
861	5	St. Joseph's island, Texas...	1853	Gust. Würdemann......	Alcoholic.	Gust. Würdemann.....

LIST OF THE PLATES.

Plate I.——Dioplites nuecensis, Grd.—p. 3.
Plate II.——Figs. 1—4.—Pomotis heros, B. & G.—p. 6.
  Figs. 5—8.—Pomotis fallax, B. & G.—p. 8.
Plate III.—-Figs. 1—4.—Pomotis aquilensis, s. nefastus, B. & G.—p. 7.
  Figs. 5—8.—Pomotis aquilensis, B. & G.—p. 7.
  Figs. 9—12.—Pomotis fallax, s. convexifrons, B. & G.—p. 8.
Plate IV.——Figs. 1—4.—Calliurus longulus, Grd.—p. 5.
  Figs. 5—8.—Pomotis speciosus, B. & G.—p. 5.
  Figs. 9—12.—Herichthys cyanoguttatus, B. & G.—p. 30.
Plate V.——Figs. 1—5.—Umbrina phalaena, Grd.—p. 13.
  Figs. 6—10.—Amblodon neglectus, Grd.—p. 12.
Plate VI.——Otolithus drummondii, Richards.—p. 12.
Plate VII.—Micropogon undulatus, Cuv. & Val.—p. 13.
Plate VIII.--Figs. 1—4.—Johnius ocelatus, Grd.—p. 14.
  Figs. 5—9.—Astyanax argentatus, B. & G.—p. 74.
  Figs. 10—13.—Pileoma carbonaria, B. & G.— p. 10.
  Figs. 14—17.—Poecilichthys lepidus, Grd.—p. 11.
Plate IX.——Figs. 1—4.—Orthopristis duplex, Grd.—p. 15.
  Figs. 5—8.—Neomaenis emarginatus, Grd.—p. 18.
  Figs. 9—12.—Eucinostomus argenteus, B. & G.—p.17.
  Figs. 13—16.—Lagodon rhomboides, Holbr.—p. 16.
Plate X.——Figs. 1—4.—Mugil berlandieri, Grd.—p. 20.
  Figs. 5—9.—Polynemus octonemus, Grd.—p. 19.
Plate XI.——Figs. 1—3.—Carangus esculentus, Grd.—p. 23.
  Fig. 4.—Doliodon carolinus, Grd.—p. 22.
  Fig. 5.—Chorinemus lanceolatus, Grd.—p. 21.
  Fig. 6.—Chloroscombrus caribbaeus, Grd.—p. 21.
  Fig. 7.—Argyreiosus capillaris, DeKay.—p. 23.
  Fig. 8.—Vomer setapinnis, Grd.—p. 24.
Plate XII.—Figs. 1—3.—Eleotris sumnulentus, Grd.—p. 28.
  Figs. 4 & 5.—Gobius lyricus, Grd.—p. 25.
  Fig. 6.—Blennius multifilis, Grd.—p. 27.
  Figs. 7 & 8.—Gobionellus hastatus, Grd.—p. 25.
  Figs. 9 & 10.—Gobius catulus, Grd.—p. 26.
  Figs. 11 & 12.—Eleotris gyrinus, Cuv. & Val.—p. 28.
  Fig. 13.—Philipnus dormitator, Cuv. & Val.—p. 29.
  Fig. 14.—Gobiosoma molestum, Grd.—p. 27.

Plate XIII.——Belone scrutator, Grd.—p. 30.
Plate XIV.——Ailurichthys marinus, B. & G.—p. 31.
Plate XV.——Arius equestris, B. & G.—p. 32.
Plate XVI.——Pimelodus affinis, B. & G.—p. 32.
Plate XVII.——Pimelodus affinis, B. & G.—p. 32.
Plate XVIII.——Pimelodus vulpes, Grd.—p. 33.
Plate XIX.——Figs. 1—4.—Ictiobus tumidus, Grd.—p. 34.
Figs. 5—8.—Ptychostomus albidus, Grd.—p. 36.
Figs. 9—12.—Luxilus leptosomus, Grd.—p. 60.
Plape XX.——Figs. 1—3.—Moxostoma victoriae, Grd.—p. 35.
Figs. 4—6.—Moxostoma campbelli, Grd.—p. 35.
Figs. 7—9.—Moxostoma kennerlii, Grd.—p. 34.
Plate XXI.——Figs. 1—4.—Minomus insignis, Grd.—p. 37.
Figs. 5—8.—Ptychostomus congestus, Grd.—p. 36.
Plate XXII.——Figs. 1—4.—Minomus plebeius, Grd.—p. 38.
Figs. 5—8.—Minomus clarki, Grd.—p. 38.
Plate XXIII.——Figs. 1—5.—Catostomus bernardini, Grd.—p. 40.
Figs. 6—10.—Acomus guzmaniensis, Grd.—p. 39.
Plate XXIV.——Figs. 1—6.—Acomus latipinnis, Grd.—p. 39.
Figs. 7—12.—Gila grahami, B. & G.—p. 61.
Plate XXV.——Figs. 1—4.—Campostoma ornatum, Grd.—p. 41.
Figs. 5—8.—Campostoma formosulum, Grd.—p. 41.
Figs. 9—12.—Campostoma nasutum, Grd.—p. 42.
Plate XXVI.——Figs. 1—4.—Dionda couchi, Grd.—p. 44.
Figs. 5—8 —Dionda argentosa, Grd.—p. 43.
Figs. 9—12.—Dionda serena, Grd.—p. 42.
Figs. 13—16.—Dionda chrysitis, Grd.—p. 43.
Figs. 17—20.—Dionda melanops, Grd.—p. 44.
Figs. 21—24.—Dionda texensis, Grd.—p. 42.
Plate XXVII.—Figs. 1—4.—Algansea tincella, Grd.—p. 46.
Figs. 5—8.—Argyreus notabilis, Grd.—p. 47.
Figs. 9—12.—Argyreus osculus, Grd.—p. 47.
Figs. 13—16.—Algoma fluviatilis, Grd.—p. 45.
Figs. 17—20.—Algoma amara, Grd.—p. 45.
Plate XXVIII.—Figs. 1—4.—Agosia metallica, Grd.—p. 49.
Figs. 5—8.—Agosia chrysogaster, Grd.—p. 48.
Figs. 9 & 10.—Meda fulgida, Grd.—p. 50.
Figs. 11—14.—Tiaroga cobitis, Grd.—p. 60.
Plate XXIX.——Figs. 1—4.—Alburnellus megalops, Grd.—p. 52.
Figs. 5—9.—Gobio gelidus, Grd.—p. 49.
Figs. 10—13.—Alburnellus amabilis, Grd.—p. 51.
Figs. 14—17.—Alburnellus socius, Grd.—p. 52.
Figs. 18—21.—Codoma vittata, Grd.—p. 53.

Plate XIX.——-Figs. 22—25.—Codoma ornata, Grd.—p. 53.
Plate XXX.—— Figs. 1—4.—Moniana rutila, Grd.—p. 57.
Figs. 5—8.—Moniana formosa, Grd.—p. 58.
Figs. 9—12.—Moniana gibbosa, Grd.—p. 59.
Figs. 13—16.—Moniana aurata, Grd.—p. 56.
Figs. 17—20.—Moniana frigida, Grd.—p. 56.
Figs. 21—24.—Moniana couchi, Grd.—p. 57.
Plate XXXI.—--Figs. 1—4.—Cyprinella venusta, Grd.—p. 54.
Figs. 5—8.—Cyprinella macrostoma, Grd.—p. 54.
Figs. 9—12.—Cyprinella texana, Grd.—p. 55.
Figs. 13—16.—Cyprinella luxiloides, Grd.—p. 55.
Figs. 17—20.—Moniana complanata, Grd.—p. 56.
Figs. 21—24.—Cliola velox, Grd.—p. 51.
Plate XXXII.—-Figs. 1—4.—Tigoma nigrescens, Grd.—p. 64.
Figs. 5—8.—Tigoma pulchra, Grd.—p. 65.
Plate XXXIII.—Figs. 1—4.—Tigoma gibbosa, Grd.—p. 64.
Figs. 5—10.—Gila emorii, Grd.—p. 62.
Plate XXXIV.—Figs. 1—4.—Ptychocheilus lucius, Grd.—p. 65.
Figs. 5—8.—Tigoma pulchella, Grd.—p. 62.
Plate XXXV.—-Figs. 1—8.—Hydrargyra similis, B. & G.—p. 68.
Figs. 9—11.—Poecilia lineolata, Grd.—p. 70.
Figs. 12—17.—Cochlognathus ornatus, B. & G.—p. 46.
Plate XXXVI.—Fundulus grandis, B. & G.—p. 69.
Plate XXXVII.-Figs. 1—7.—Cyprinodon elegans, B. & G.—p. 66.
Figs. 8—11.—Cyprinodon macularius, B. & G.—p. 68.
Figs. 12—18.—Cyprinodon bovinus, B. & G.—p. 67.
Plate XXXVIII.-Figs. 1—7.—Cyprinodon gibbosus, B. & G.—p. 67.
Figs. 8—14.—Limia poeciloides, Grd.—p. 70.
Plate XXXIX.—Figs. 1—7.—Gambusia patruelis, Grd.—p. 72.
Figs. 8—11.—Gambusia nobilis, Grd.—p. 71.
Figs. 12—15.—Gambusia affinis, Grd.—p. 72.
Figs. 16—19.—Girardinus occidentalis, Grd.—p. 73.
Figs. 20—23.—Limia venusta, Grd.—p. 71.
Plate XL.——— Anguilla tyrannus, Grd.—p. 75.
Plate XLI.——-Neomuraena nigromarginata, Grd.—p. 77.

ALPHABETICAL INDEX.

(*Synonyms are in italics.*)

Page.

A.

Acomus guzmaniensis 39
" latipinnis 39
æstivalis, Gobio 49
affinis, Gambusia 72
affinis, Heterandria 72
affinis, Pimelodus 32
Agosia 48
" chrysogaster 48
" metallica 49
Ailurichthys 31
" blochii 31
" eydouxi 31
" gronovii 31
" marinus 31
albidus, Ptychostomus 36
Alburnellus amabilis 51
" megalops 52
" socius 52
Alburnus *amabilis* 51
" *megalops* 52
" *socius* 52
alepidotum, Gobiosoma 27
alepidotus, Gobius 27
Algansea tincella 46
Algoma 44
" amara 45
" fluviatilis 45
amabilis, Alburnellus 51
amabilis, Alburnus 51
amara, Algoma 45
Amblodon concinnus 13
" grunniens 12
" lineatus 13
" neglectus 12
Anguilla tyrannus 75
antillanus, Conodon 11
aquilensis, Pomotis 7
argentatus, Astyanax 74
argenteus, Eucinostomus 17
argentosa, Dionda 43
Argyreiosus capillaris 23
Argyreus notabilis 47
" osculus 47
Arius equestris 32
Astyanax 74
" argentatus 74

Page.

Atherinidae 19
Atherinopsis 19
aurata, Moniana 56

B.

bacalaus, Gobionellus 24
bacalaus, Gobius 24
bartholomaei, Carangus 23
bartholomaei, Caranx 23
Batrachidae 11
Batrachus tau 11
Belone scrutator 30
berlandieri, Mugil 20
bernardini, Catostomus 40
Blennidae 27
Blennius, multifilis 27
blochii, Ailurichthys 31
blochii, Galeichthys 31
Boleosoma *lepida* 11
boscii, Gobius 27
Bothrolaemus 22
bovinus, Cyprinodon 67
brasiliensis, Gobionellus 24
brasiliensis, Gobius 24
brownii, Vomer 24
Bryttus *longulus* 5

C.

Calliurus longulus 5
" melanops 10
campbelli, Moxostoma 34
Campostoma 40
" formosulum 41
" nasutum 42
" ornatum 41
capillaris, Argyreiosus 23
capillaris, Zeus 23
Carangus bartholomaei 23
" chrysos 23
" defensor 23
" esculentus 23
" falcatus 23
" fallax 23
" pisquetus 23
" richardi 23
carangus, Scomber, Caranx 23

Page.
Caranx *bartholomaei* 23
" *carangus* 23
" *chrysos* 23
" *defensor* 23
" *falcatus* 23
" *fallax* 23
" *pisquetus* 23
" *richardi* 23
carbonaria, Pileoma 10
caribbaeus, Chloroscombrus 21
carolina, Lichia 22
carolinus, Doliodon 22
Carpiodes *tumidus* 34
Catostomus bernardini 40
" *clarkii* 38
" *congestus* 36
" *guzmaniensis* 39
" *insignis* 37
" *latipinnis* 39
" *plebeius* 38
catulus, Gobius 26
Centropomus undecimalis 10
Characinidae 73
Chatoessus 75
Chloroscombrus 21
" caribbaeus 21
Chorinemus 20
" lanceolatus 21
chrysitis, Dionda 43
chrysogaster, Agosia 48
chrysos, Carangus 23
chrysos, Caranx 23
clarki, Minomus 38
clarkii, Catostomus 38
Cliola velox 51
Clupeidae 75
Clupeonia 75
cobitis, Tiaroga 60
Cochlognathus 45
" ornatus 46
Codoma 53
" ornata 53
" vittata 53
coerulescens, Pimelodus 32
complanata, Moniana 56
concinnus, Amblodon 13
congestus, Catostomus 36
congestus, Ptychostomus 36
Conodon antillanus 11
convexifrons, Pomotis 8
Corvina, *ocellata* 14
couchi, Dionda 44
couchi, Moniana 57
cyano-guttatus, Herichthys 30
Cyprinella luxiloides 55
" macrostoma 54
" texana 55
" venusta 54
Cyprinidae 34

Page.
Cyprinodon 66
" bovinus 67
" elegans 66
" gibbosus 67
" macularius 68
Cyprinodontidae 66

D.

defensor, Carangus 23
defensor, Caranx 23
Dionda argentosa 43
" chrysitis 43
" couchi 44
" melanops 44
" serena 42
" texensis 42
Dioplites fasciatus 3
" nobilis 3
" nuecensis 3
" salmoides 3
Doliodon 22
" carolinus 22
" spinosus 22
dormitator, Philipnus 29
drummondi, Otolithus 12
duplex, Orthopristis 15

E.

Echeneidae 29
Echeneis 29
elegans, Cyprinodon 66
elegans, Gila 61
Eleotris sumnulentus 28
" gyrinus 28
emarginatus, Neomaenis 18
emarginatus, Lobotes 18
emorii, Gila 62
Engraulis 75
equestris, Arius 32
esculentus, Carangus 23
Etheostomidae 10
Eucinostomus 17
" argenteus 17
eydouxi, Ailurichthys 31
eydouxii, Galeichthys 31

F.

falcatus, Carangus 23
falcatus, Caranx 23
fallax, Carangus 23
fallax, Caranx 23
fallax, Pomotis 8
fasciatus, Dioplites 3
fasciatus, Grystes 3
fasciatus, Pogonias 11
fluviatilis, Algoma 45
formosa, Moniana 58
formosulum, Campostoma 41

Page.
frigida, Moniana 56
fulgida, Meda 50
Fundulus grandis 69

G.

Galeichthys *blochii* 31
" *eydouxii* 31
" *gronovii* 31
" *marinus* 31
" *parae* 31
Gambusia affinis 72
" nobilis 71
" patruelis 72
gelidus, Gobio 49
Gerres 17
gibbosa, Gila 64
gibbosa, Moniana 59
gibbosa, Tigoma 64
gibbosus, Cyprinodon 67
Gila elegans 61
" emorii 62
" *gibbosa* 64
" grahami 61
" *pulchella* 62
Girardinus occidentalis 73
Gobidae 24
Gobio aestivalis 49
" gelidus 49
Gobionellus 24
" bacalaus 24
" brasiliensis 24
" hastatus 24
" lanceolatus 21
" smaragdus 24
Gobiosoma 27
" alepidotum 27
" molestum 27
Gobius *alepidotus* 27
" *bacalaus* 24
" *boscii* 27
" *brasiliensis* 24
" catulus 26
" gulosus 26
" *lanceolatus* 24
" lyricus 25
" *smaragdus* 24
" *viridi-pallidus* 27
" wurdemanni 25
gracilis, Moniana 59
grahami, Gila 61
grandis, Fundulus 69
gronovii, Ailurichthys 31
gronovii, Galeichthys 31
grunniens, Amblodon 12
Grystes *fasciatus* 3
" *nobilis* 3
" *nuecensis* 3
" *salmoides* 3
gulosus, Gobius 26

Page
guzmaniensis, Acomus 39
guzmaniensis, Catostomus 39
gyrinus, Eleotris 28

H.

Haemulon 15
hastatus, Gobionellus 24
Herichthys 30
" cyano-guttatus 30
Heros 30
heros, Pomotis 6
Heterandria affinis 72
" *nobilis* 71
" *occidentalis* 73
" *patruelis* 72
Homoprion lanceolatus 11
xanthurus 11
Hydrargyra similis 68

I.

Ictiobus tumidus 34
imberbis, Sciaena 14
insignis, Catostomus 37
insignis, Minomus 37
intermedia, Tigoma 63

J.

Johnius ocellatus 14
josephi, Ophidion 29

K.

kennerlii, Moxostoma 34

L.

Labridae 30
Lagodon rhomboides 16
lanceolatus, Chorinemus 21
lanceolatus, Gobionellus 24
lanceolatus, Gobius 24
lanceolatus, Homoprion 11
latipinnis, Acomus 39
latipinnis, Catostomus 39
Leiostomus obliquus 11
lepida, Boleosoma 11
lepidus, Poecilichthys 11
leptosomus, Luxilus 60
lepturus, Trichiurus 24
Lichia *carolina* 22
Leuciscus *tincella* 46
Limia 70
" poeciloides 70
" venusta 71
lineatus, Amblodon 13
lineolata, Poecilia 70
Lobotes *emarginatus* 18
longulus, Calliurus 5
longulus, Bryttus, Pomotis 5
lucius, Ptychocheilus 65
Luxilus leptosomus 60
luxiloides, Cyprinella 55
lyricus, Gobius 25

Page.

M.

macrostoma, Cyprinella 54
macularius, Cyprinodon 68
Maenidae 17
marinus, Ailurichthys 31
marinus, Galeichthys 31
Meda 50
“ fulgida 50
megalops, Alburnellus 52
megalops, alburnus 52
melanops, Dionda 44
melanops, Calliurus 10
Meletta 75
metallica, Agosia 49
mexicanus, Saurus 75
Micropogon undulatus 13, 14
Minomus 37
“ insignis 37
“ plebeius 38
“ clarki 38
molestum, Gobiosoma 27
Mollinesia 69
Moniana aurata 56
“ complanata 56
“ couchi 57
“ formosa 58
“ frigida 56
“ gibbosa 59
“ gracilis 59
“ nitida 58
“ proserpina 59
“ rutila 57
Moxostoma campbelli 35
“ kennerlii 34
“ victoriae 35
mucronatus, Neoconger 77
Mugil berlandieri 20
Mugilidae 19
multifilis, Blennius 27
Muraenidae 75

N.

nasutum, Campostoma 42
nefastus, Pomotis 7
neglectus, Amblodon 12
Neoconger 77
“ mucronatus 77
Neomaenis 18
“ emarginatus 18
Neomuraena 76
“ nigro-marginata 76
nigrescens, Tigoma 64
nigro-marginata, Neomuraena 76
nitida, Moniana 58
nobilis, Dioplites 3
nobilis, Gambusia 71
nobilis, Grystes 3
nobilis, Heterandria 71

Page.

notabilis, Argyreus 47
nothus, Otolithus 11
nuecensis, Dioplites 3
nuecensis, Grystes 3

O.

obliquus, Leiostomus 11
occidentalis, Girardinus 73
occidentalis, Heterandria 73
ocellata, Corvina, Perca 14
ocellatus, Johnius 14
octonemus, Polynemus 19
Ophididae 29
Ophidion josephi 29
“ taylori 29
ornata, Codoma 53
ornatum, Campostoma 41
ornatus, Cochlognathus 46
Orthopristis 15
“ duplex 15
osculus, Argyreus 47
Otolithus drummondi 12
“ nothus 11
ovis, Sargus 11

P.

parae, Galeichthys 31
pampanus, Bothrolaemus 22
pampanus, Trachinotus 22
patruelis, Gambasia 72
patruelis, Heterandria 72
Perca *undulata* 14
“ *ocellata* 14
phalaena, Umbrina 13
Philipnus dormitator 29
Pileoma carbonaria 10
Pimelodus affinis 32
“ coerulescens 32
“ vulpes 33
pisquetus, Carangus 23
pisquetus, Caranx 23
plebeius, Catostomus 38
plebeius, Minomus 38
Pleuronectidae 29
Poecilia 69
“ lineolata 70
Poecilichthys lepidus 11
poeciloides, Limia 70
Pogonias fasciatus 11
Pomotis aquilensis 7
“ *convexifrons* 8
“ fallax 8
“ heros 6
“ *longulus* 5
“ *nefastus* 7
“ speciosus 5
Polynemidae 19
Polynemus octonemus 19

Page.

Pristipoma 15
proserpina, Moniana 59
Ptychocheilus lucius 65
Ptychostomus congestus 36
" albidus 36
pulchella, Gila 62
pulchella, Tigoma 62
pulchra, Tigoma 65
purpurea, Tigoma 63

R.

rhomboides, Lagodon 16
rhomboides, Sparus, Sargus 16
richardi, Carangus 23
richardi, Caranx 23
rutila, Moniana 57

S.

salmoides, Dioplites 3
salmoides, Grystes 3
Saurus mexicanus 75
Sciaenidae 11
Sciaena *imberbis* 14
Scomber *carangus* 23
Scomberesocidae 30
Scombridae 20
Scopelinidae 75
scrutator, Belone 30
serena, Dionda 42
setapinnis, Vomer 24
setapinnis, Zeus 24
Siluridae 31
Silurus *marinus* 31
similis, Hydrargyra 68
smaragdus, Gobionellus 24
smaragdus, Gobius 24
socius, Alburnellus 52
socius, alburnus 52
Sparidae 15
speciosus, Pomotis 5
spinosus, Doliodon 22
spinosus, Zeus 22
Sargus ovis 11
sumnulentus, Eleotris 28

T.

Page.

Taenioidae 24
tau, Batrachus 11
taylori, Ophidion 29
texana, Cyprinella 55
texensis, Dionda 42
Tiaroga 60
" cobitis 60
Tigoma gibbosa 64
" intermedia 63
" nigrescens 64
" pulchella 62
" pulchra 65
" purpurea 63
tincella, Algansea 46
tincella, Leuciscus 46
Trachinotus *pampanus* 22
Trichiurus lepturus 24
tumidus, Carpiodes 34
tumidus, Ictiobus 34
tyrannus, Anguilla 75

U.

Umbrina phalaena 13
undecimalis, Centropomus 10
undulata, Perca 14
undulatus, Micropogon 13, 14

V.

velox, Cliola 51
venusta, Cyprinella 54
venusta, Limia 71
viridi-pallidus, Gobius 27
vittata, Codoma 53
Vomer *brownii* 24
" setapinnis 24
vulpes, Pimelodus 33

W.

wurdemanni, Gobius 26

X.

xanthurus, Homoprion 11

Z.

Zeus *capillaris* 23
" *setapinnis* 24

CONTENTS.

Page.
Family Percidae 3
Dioplites nuecensis 3
Calliurus longulus 5
1. Pomotis speciosus 5
2. Pomotis heros 6
3. Pomotis aquilensis 7
4. Pomotis fallax 8
Family Etheostomidae 10
Pileoma carbonaria 10
Poecilichthys lepidus 11
Family Batrachidae 11
Family Sciaenidae 11
Otolithus drummondi 12
Amblodon neglectus 12
Umbrina phalaena 13
Micropogon undulatus 13
Johnius ocellatus 14
Orthopristis 15
Orthopristis duplex 15
Family Sparidae 15
Lagodon rhomboides 16
Family Maenidae 17
Eucinostomus 17
Eucinostomus argenteus 17
Neomaenis 18
Neomaenis emarginatus 18
Family Polynemidae 19
Polynemus octonemus 19
Family Atherinidae 19
Family Mugilidae 19
Mugil berlandieri 20
Family Scombridae 20
Chorinemus 20
Chorinemus lanceolatus 21
Chloroscombrus 21
Chloroscombrus caribbaeus 21
Doliodon 22
Doliodon carolinus 22
Carangus 23
Carangus esculentus 23
Argyreiosus capillaris 23
Vomer setapinnis 42
Family Taenioidae ....

Page.
Family Gobidae 24
Gobionellus 24
Gobionellus hastatus 25
1. Gobius lyricus 25
2. Gobius wurdemanni 25
3. Gobius catulus 26
4. Gobius gulosus 26
Gobiosoma 27
Gobiosoma molestum 27
Family Blennidae 27
Blennius multifilis 27
1. Eleotris sumnulemtus 28
2. Eleotris gyrinus 28
Philipnus dormitator 29
Family Pleuronectidae 29
Family Echeneidae 29
Family Ophididae 29
Ophidion josephi 29
Family Scomberesocidae 30
Belone scrutator 30
Family Labridae 30
Herichthys 30
Herichthys cyano-guttatus 30
Family Siluridae 31
Ailurichthys 31
Ailurichthys marinus 31
Arius equestris 32
1. Pimelodus affinis 32
2. Pimelodus vulpes 33
Family Cyprinidae 34
Ictiobus tumidus 34
1. Moxostoma kennerlii 34
2. Moxostoma victoriae 35
3. Moxostoma campbelli 35
1. Ptychostomus congestus 36
2. Ptychostomus albidus 36
Minomus 37
1. Minomus insignis 37
2. Minomus plebeius 38
3. Minomus clarki 38
1. Acomus latipinnis 39
2. Acomus guzmaniensis 39
Catostomus bernardini 40

Page.

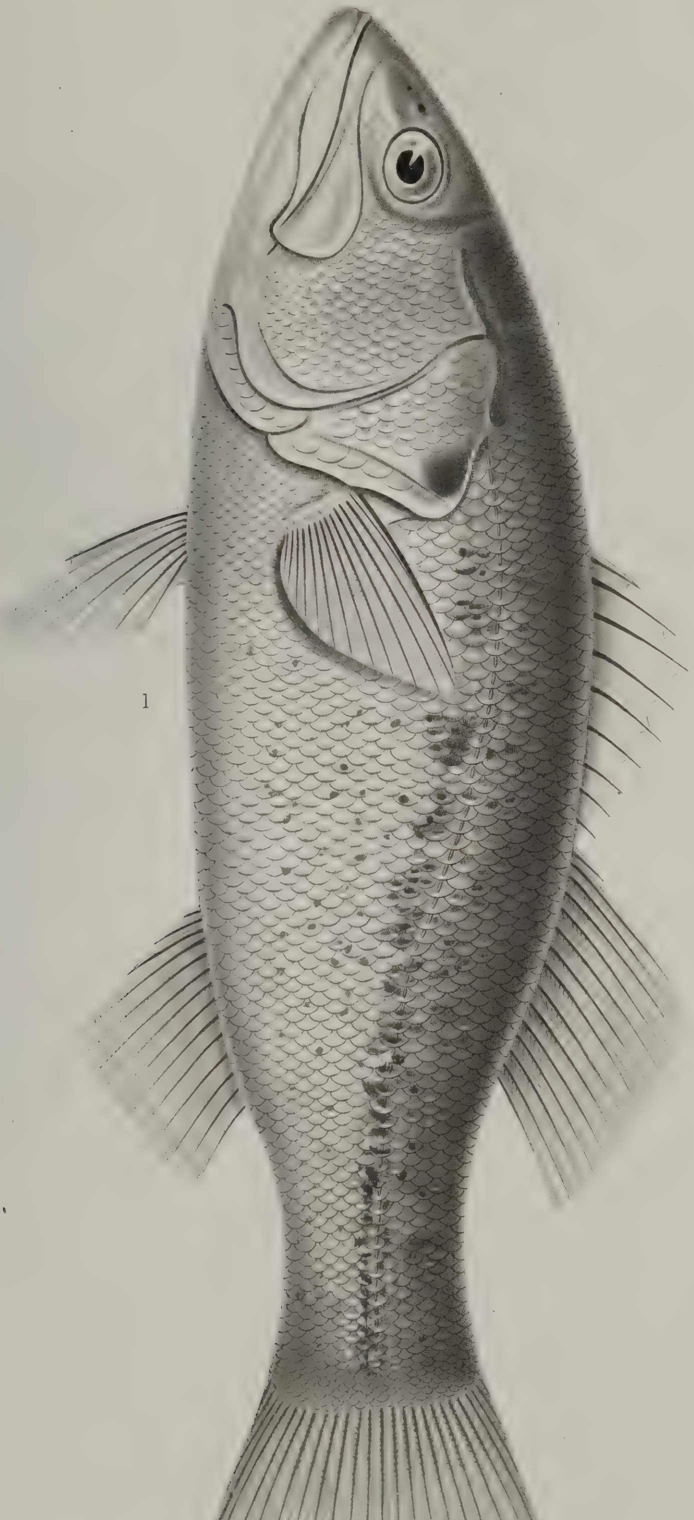
Family Cyprinidae—Continued.

Campostoma 40
1. Campostoma ornatum 41
2. Campostoma formosulum 41
3. Campostoma nasutum 42
1. Dionda serena 42
2. Dionda texensis 42
3. Dionda argentosa 43
4. Dionda chrysitis 43
5. Dionda melanops 44
6. Dionda couchi 44
Algoma 44
1. Algoma amara 45
2. Algoma fluviatilis 45
Cochlognathus 45
Cochlognathus ornatus 46
Alganseа tincella 46
1. Argyreus osculus 47
2. Argyreus notabilis 47
Agosia 48
1. Agosia chrysogaster 48
2. Agosia metallica 49
Gobio aestivalis 49
Meda 50
Meda fulgida 50
Cliola velox 51
1. Alburnellus amabilis 51
2. Alburnellus megalops 52
3. Alburnellus socius 52
Codoma 53
1. Codoma ornata 53
2. Codoma vittata 53
1. Cyprinella macrostoma 54
2. Cyprinella venusta 54
3. Cyprinella texana 55
4. Cyprinella luxiloides 55
1. Moniana aurata 56
2. Moniana complanata 56
3. Moniana frigida 56
4. Moniana couchi 57
5. Moniana rutila 57
6. Moniana nitida 58
7. Moniana formosa 58
8. Moniana gracilis 59
9. Moniana gibbosa 59
10. Moniana proserpina 59

Paeg.

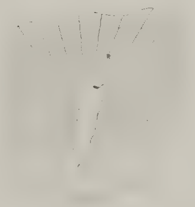
Family Cyprinidae—Continued.

Luxilus leptosomus 60
Tiaroga 60
Tiaroga cobitis 60
1. Gila elegans 61
2. Gila grahami 61
3. Gila emorii 62
1. Tigoma pulchella 62
2. Tigoma purpurea 63
3. Tigoma intermedia 63
4. Tigoma gibbosa 64
5. Tigoma nigrescens 64
6. Tigoma pulchra 65
Ptychocheilus lucius 65
Family Cyprinodontidae 66
Cyprinodon 66
1. Cyprinodon elegans 66
2. Cyprinodon gibbosus 67
3. Cyprinodon bovinus 67
4. Cyprinodon macularius 68
Hydrargyra similis 68
Fundulus grandis 69
Poecilia 69
Poecilia lineolata 70
Limia 70
1. Limia poeciloides 70
2. Limia venusta 71
1. Gambusia nobilis 71
2. Gambusia affinis 72
3. Gambusia patruelis 72
Girardinus occidentalis 73
Family Characinidae 73
Astyanax 74
Astyanax argentatus 74
Family Scopelidae 75
Family Clupeidae 75
Family Muraenidae 75
Anguilla tyrannus 75
Neomuraena 76
Neomuraena nigro-marginata 76
Neoconger 77
Neoconger mucronatus 77
List of the Plates 78
Alphabetical index 81



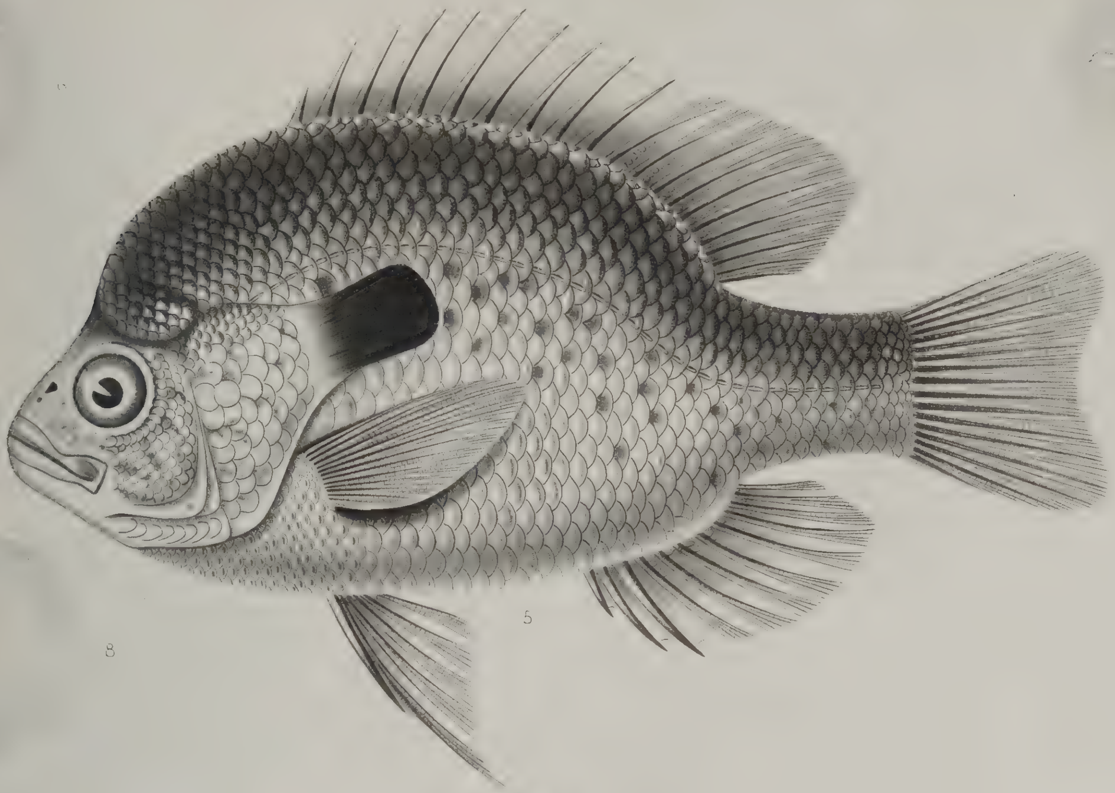
1

2

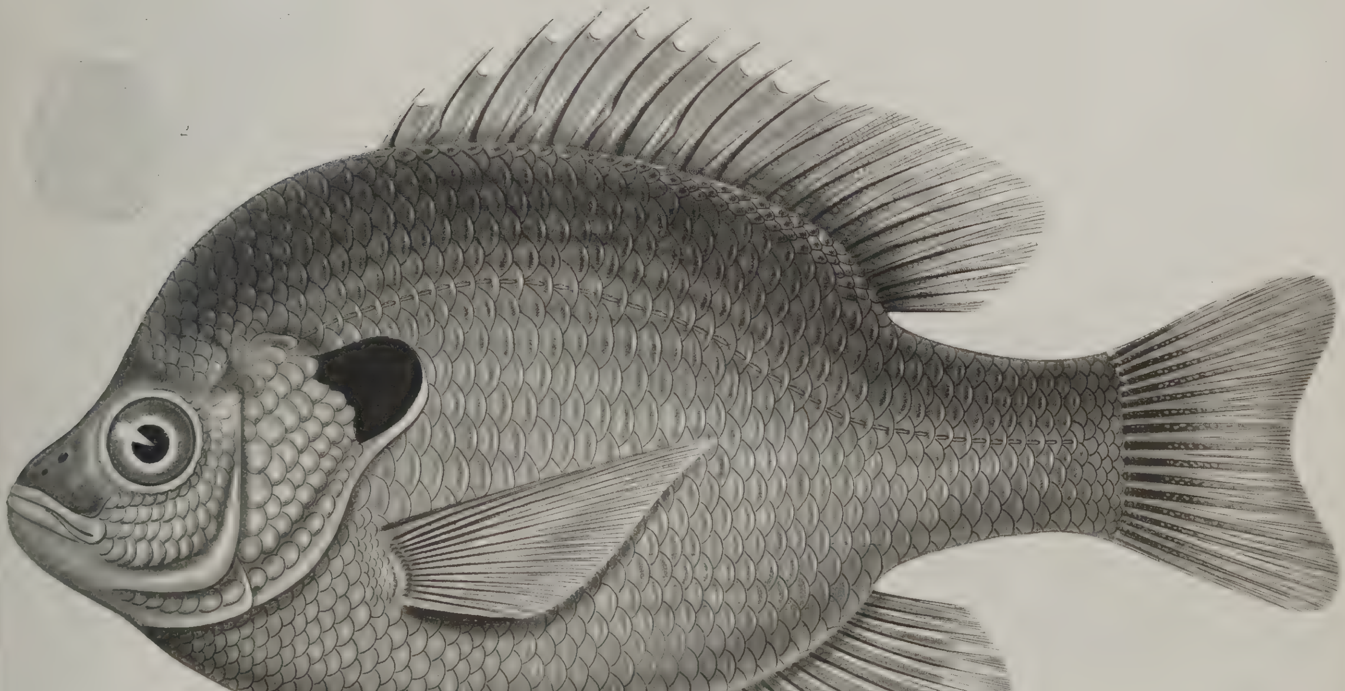


3

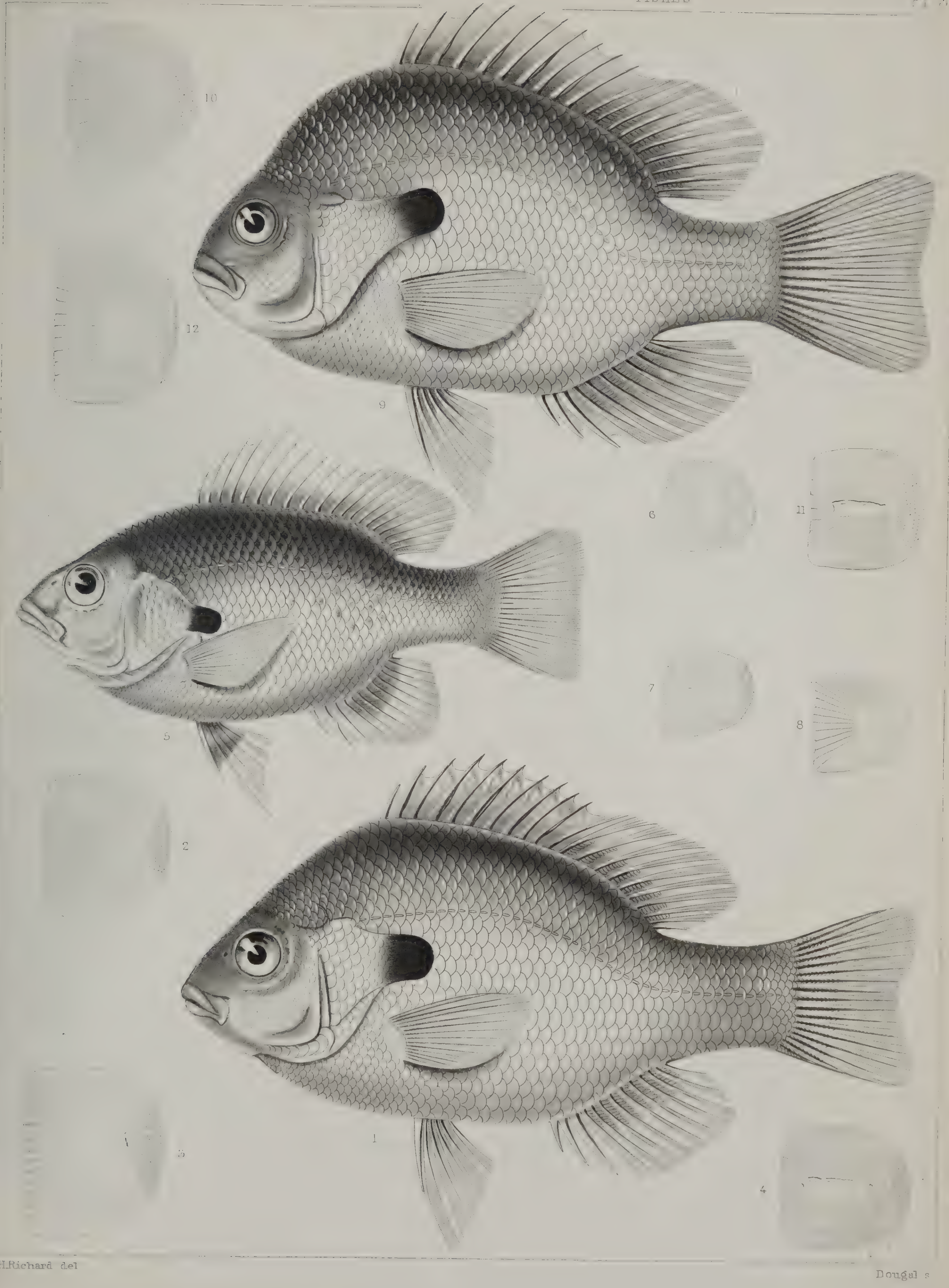
4



5

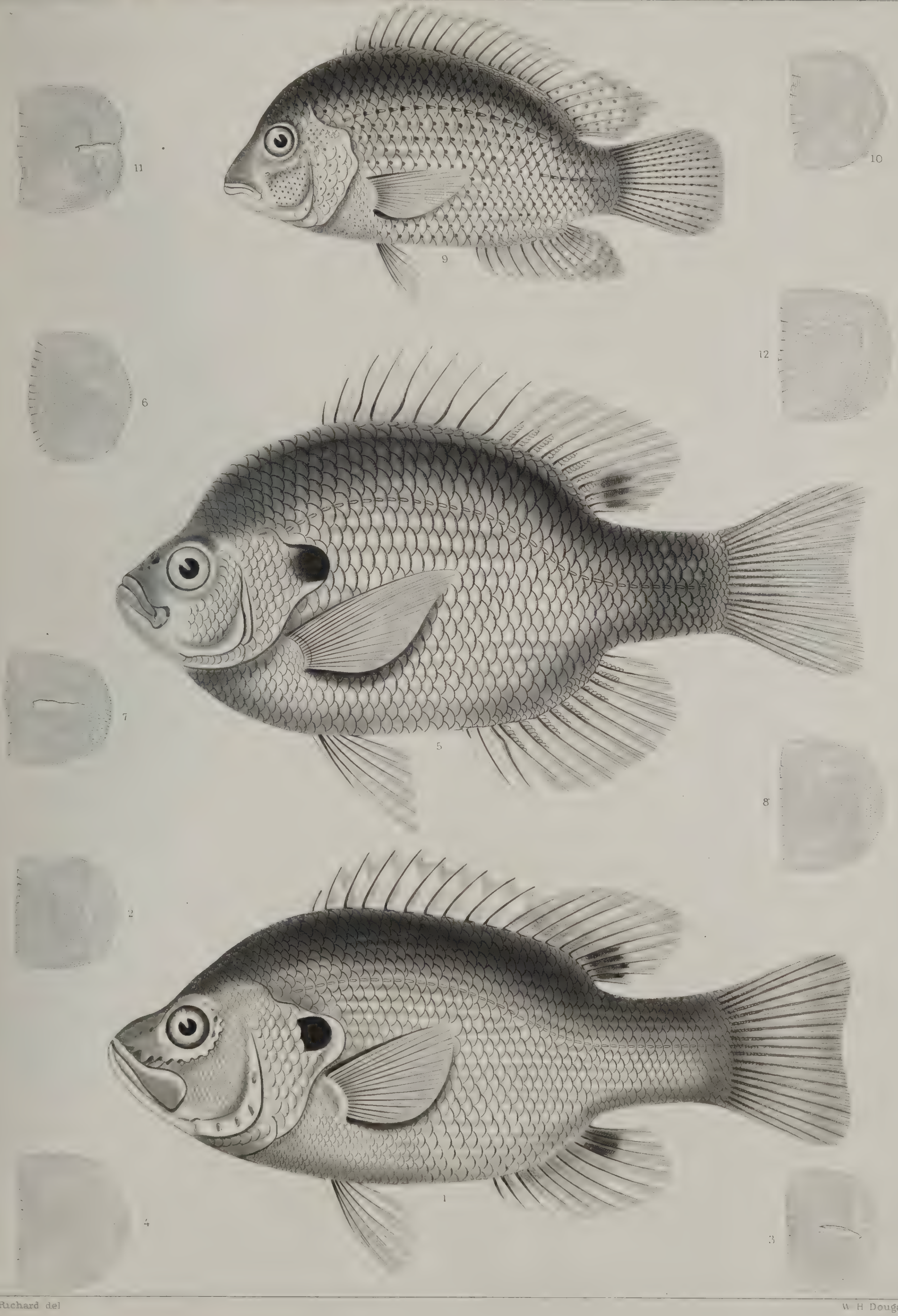


1



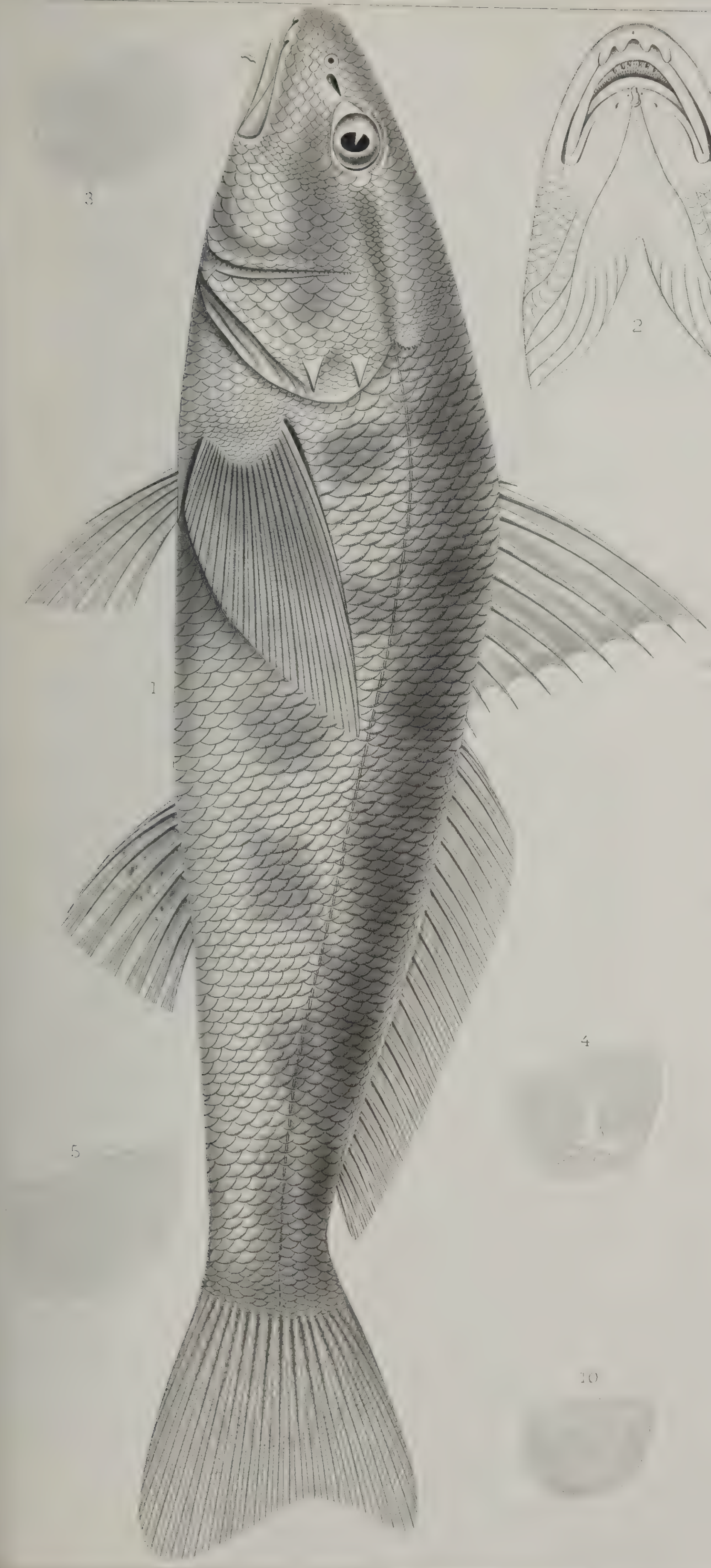
J.H.Richard del

Dougal s

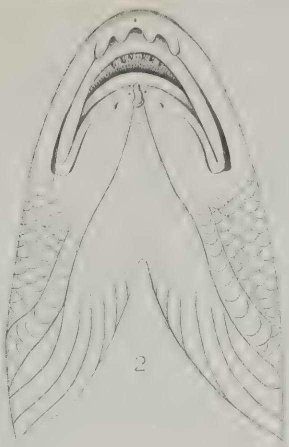


J. H. Richard del. W. H. Dougal sc.

3

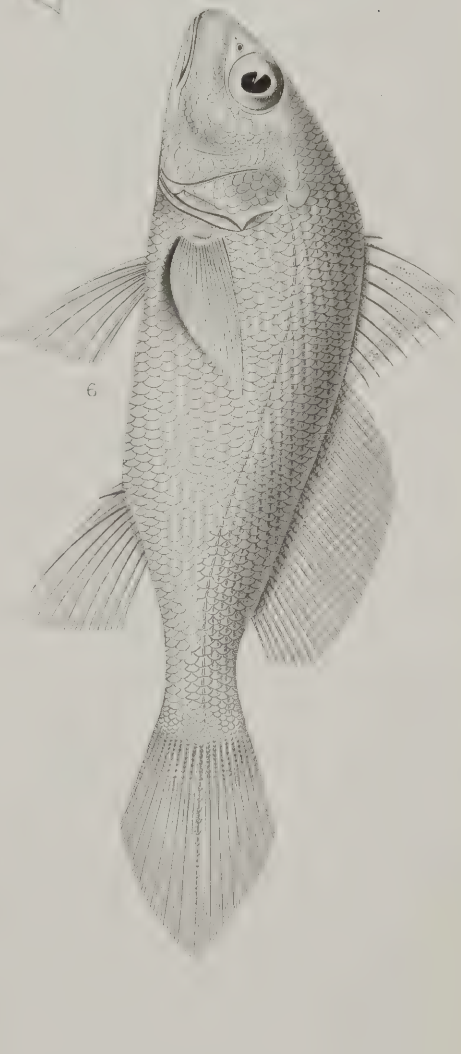


1



2

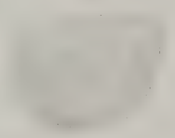
7



6

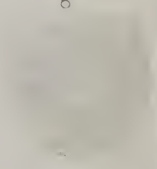
4

5

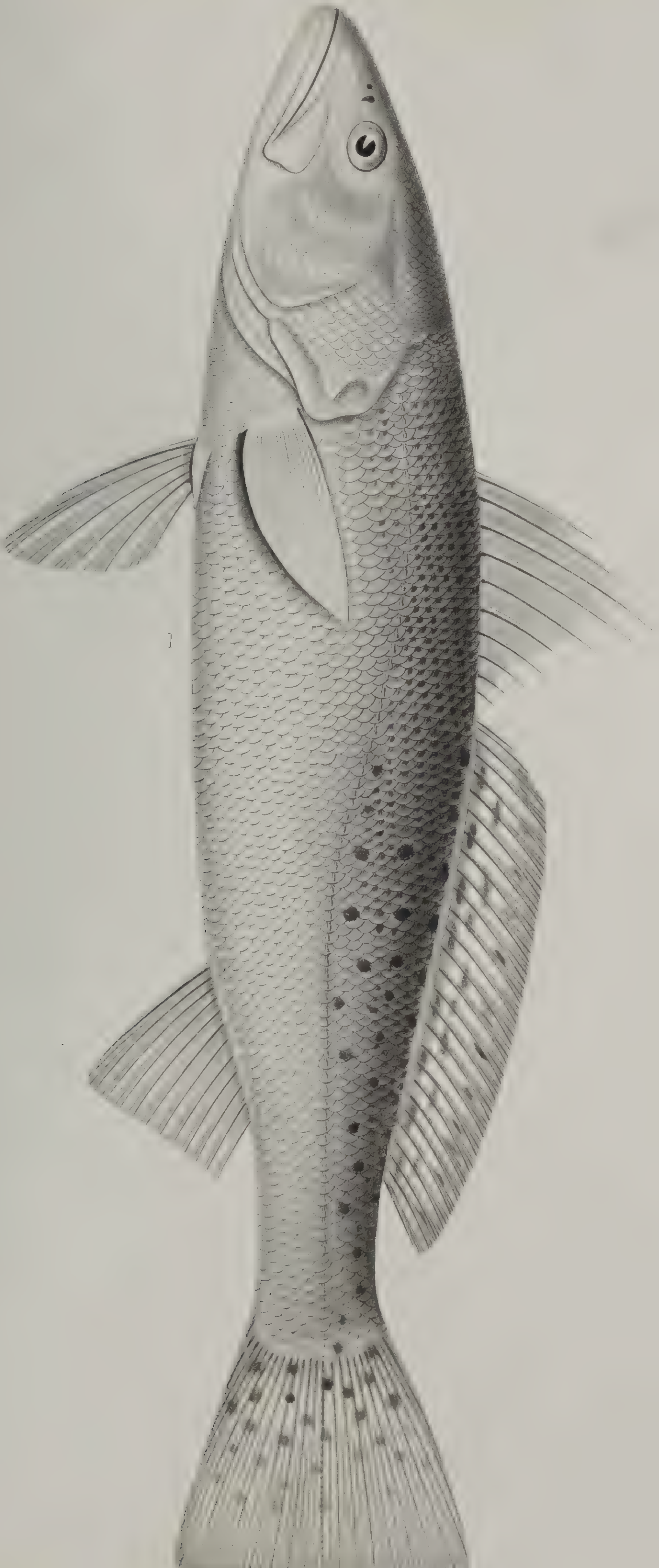


10

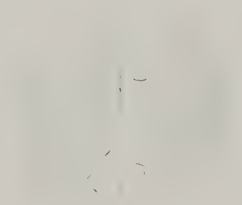
9



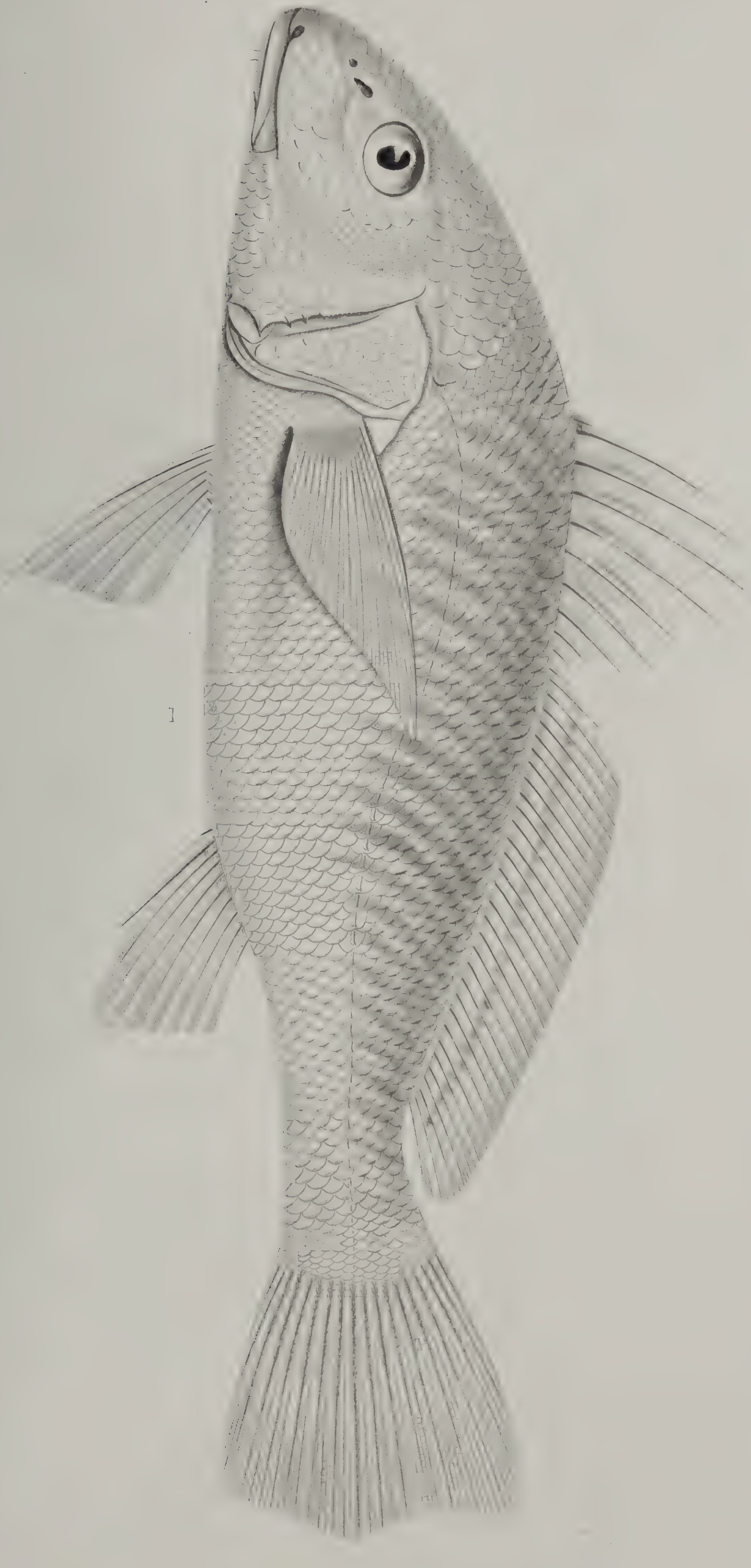
8


1

2

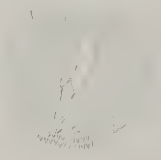

3

4

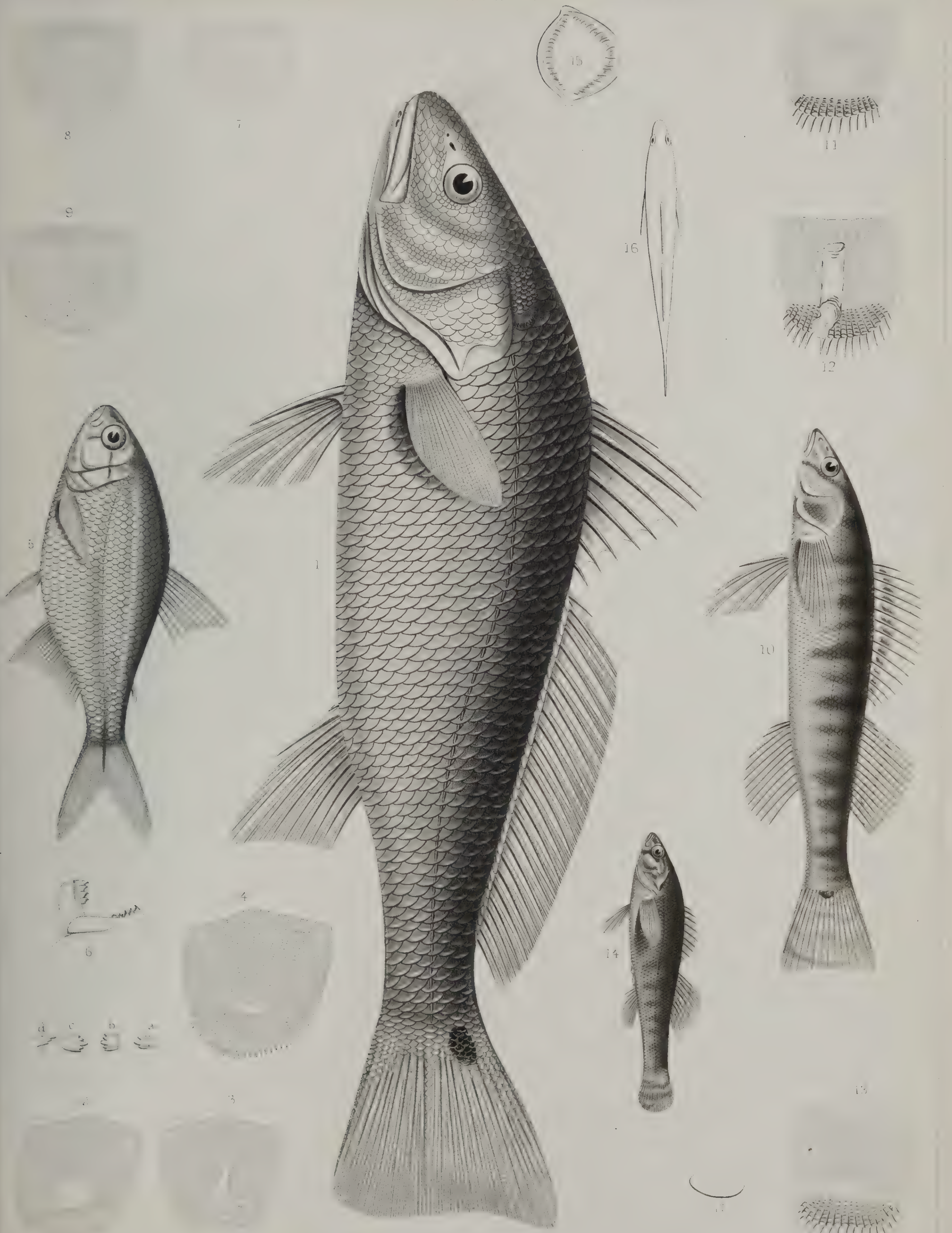

1

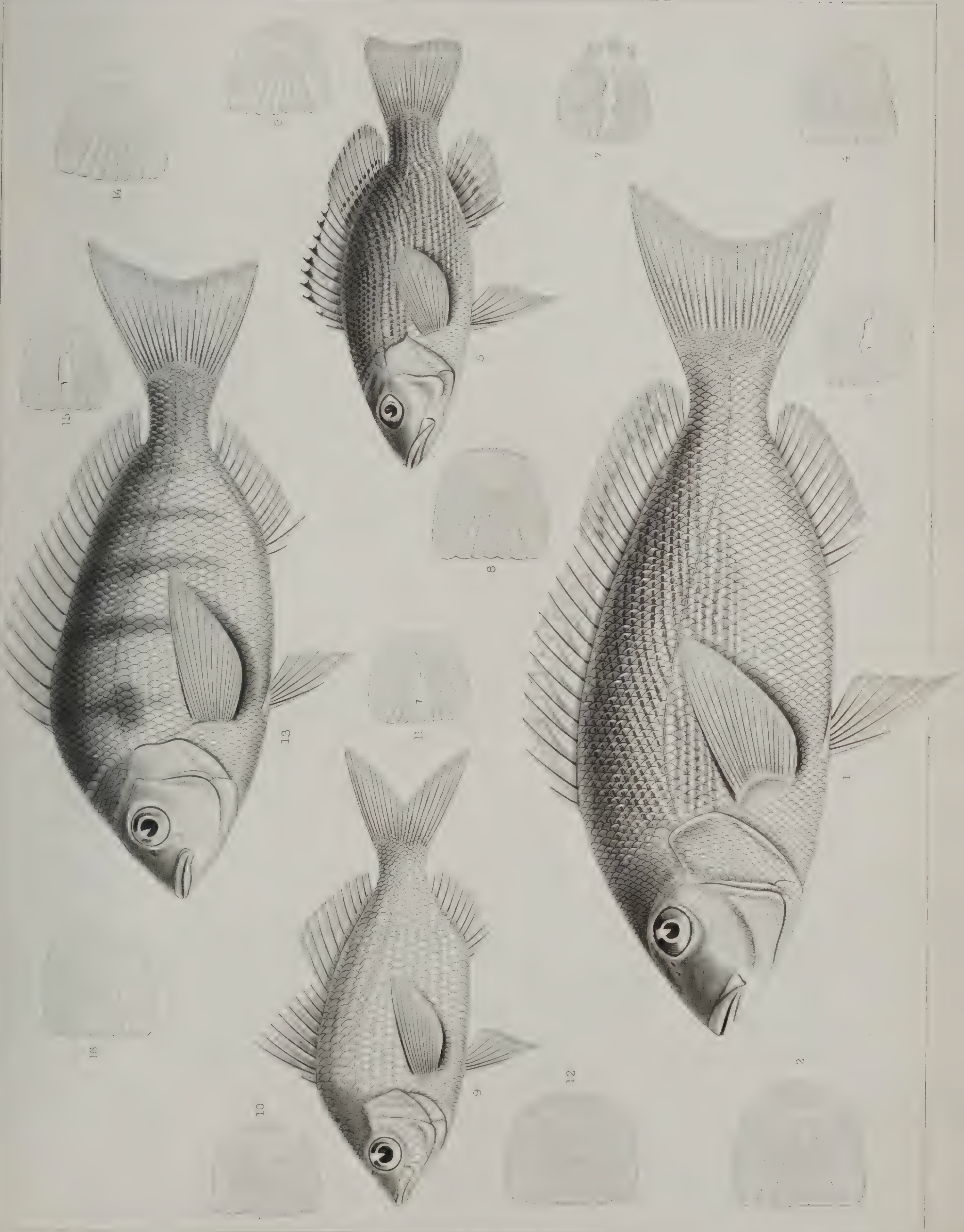
2

3

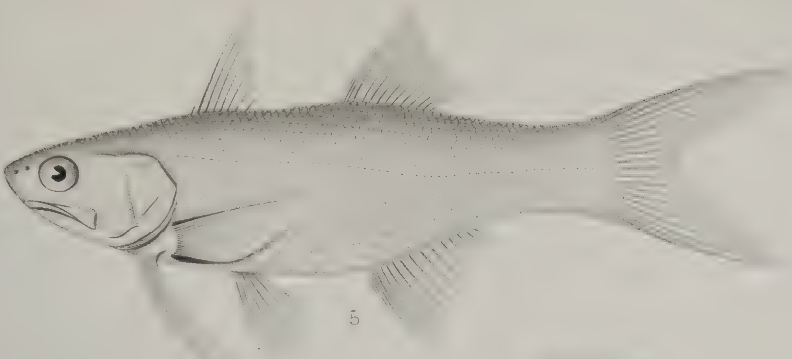

4

5

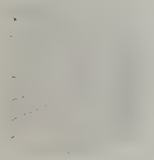

15
8
7
11
9
16
12
5
1
10
6
4
14
d c b a
2
3
13
17



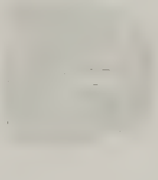
J H Richard del



5

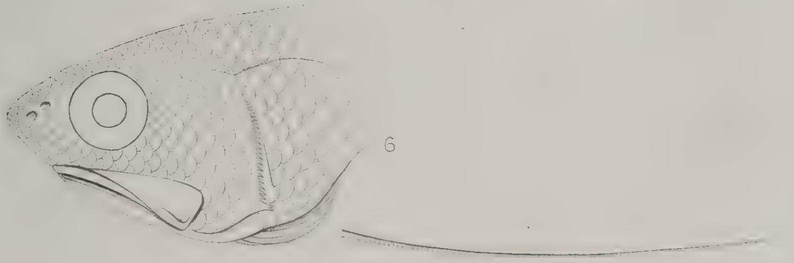


7

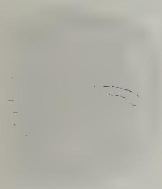


8

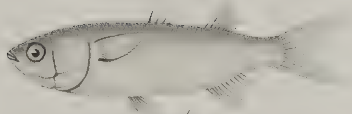
9



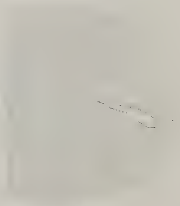
6



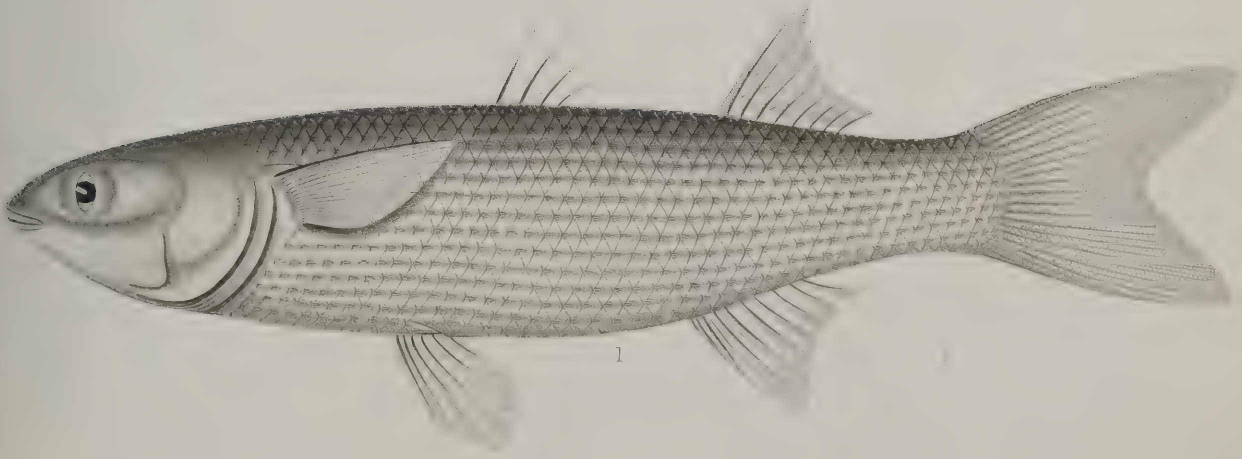
2



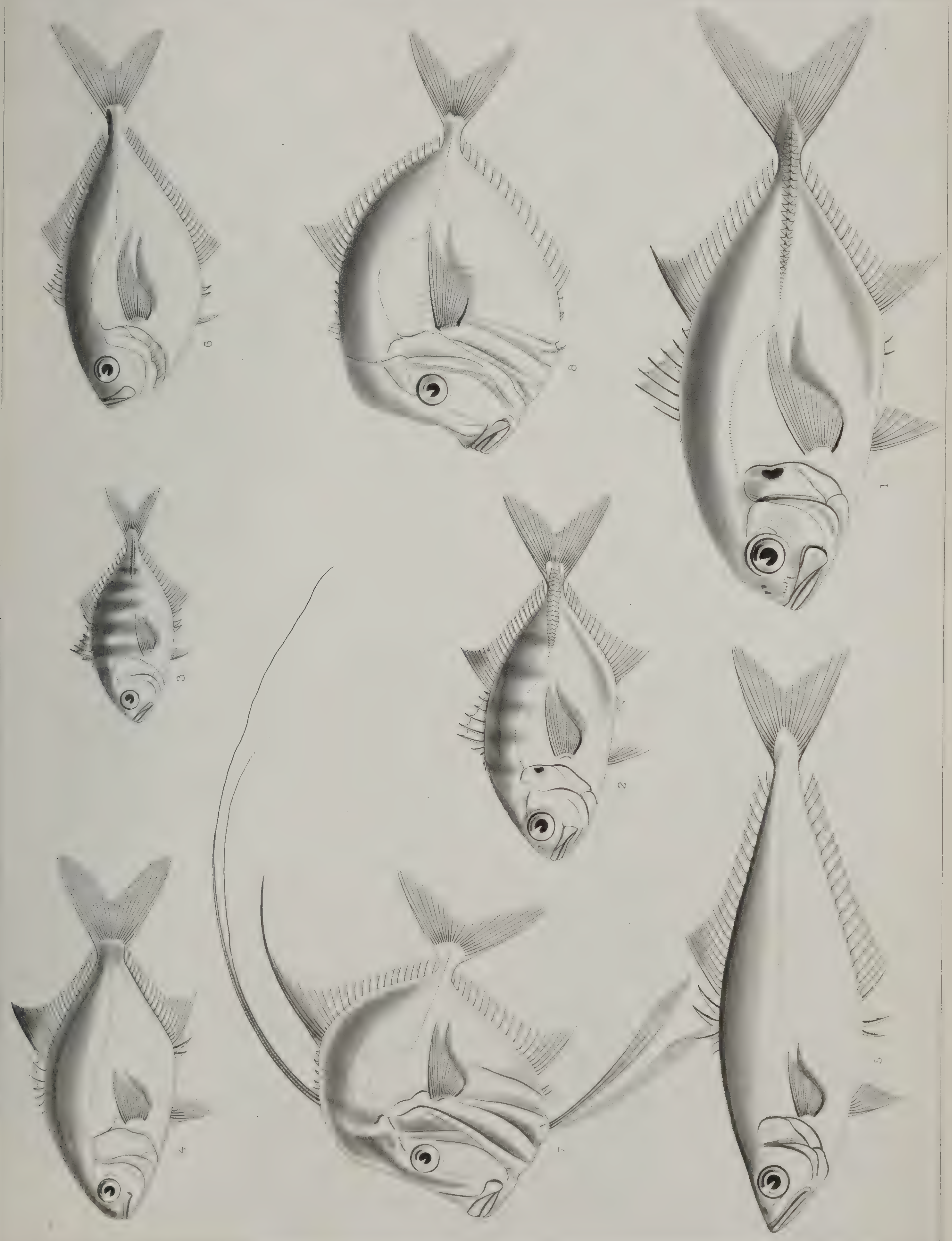
4



3

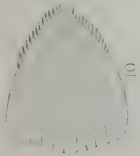


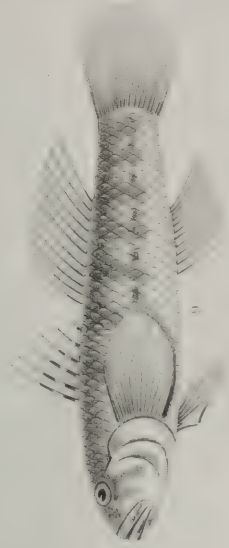
1

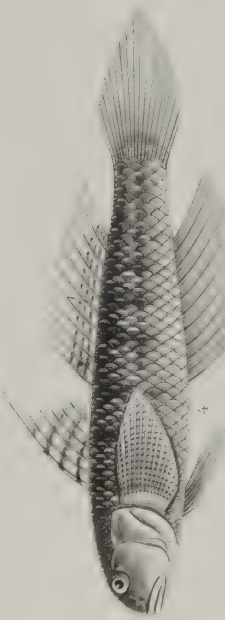


J.H.Richard del.

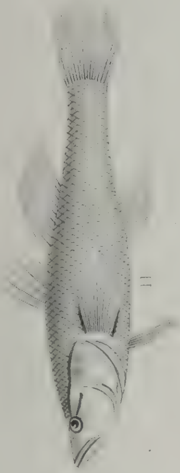
Dougal sc.

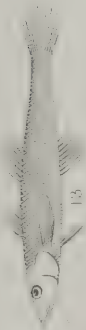

10

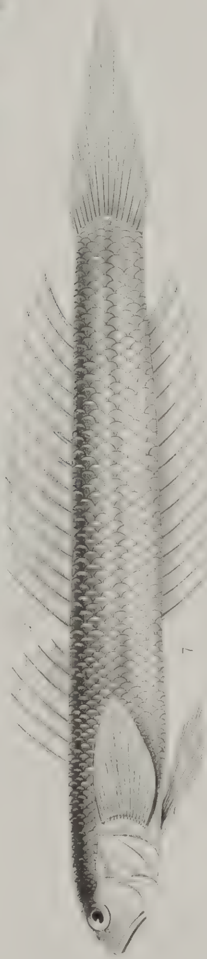

9

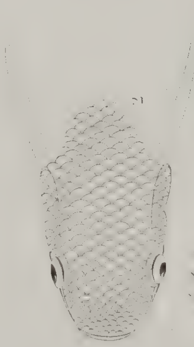

4

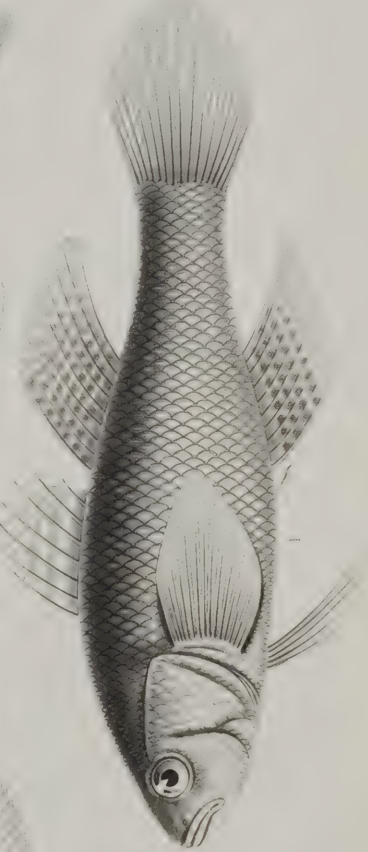
5


11

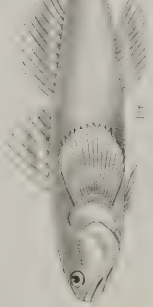

13

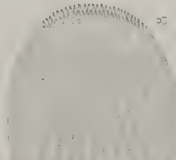

7

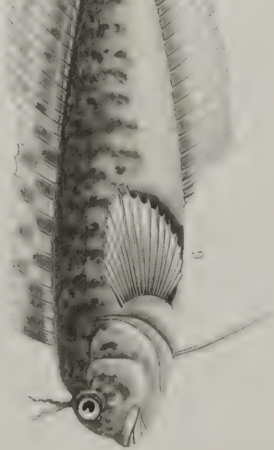

2

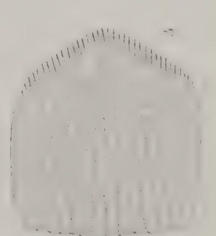

1

14


12

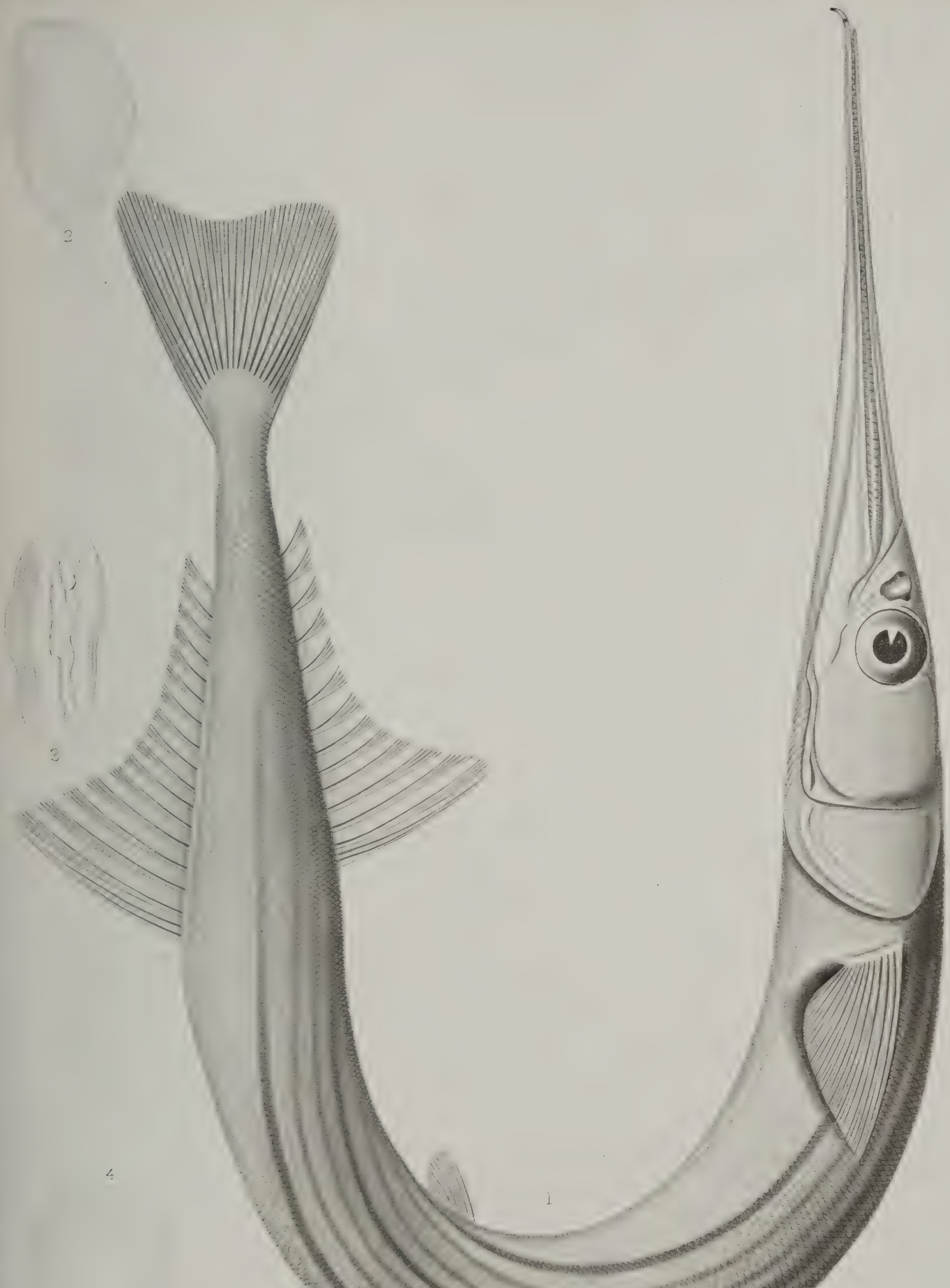

8

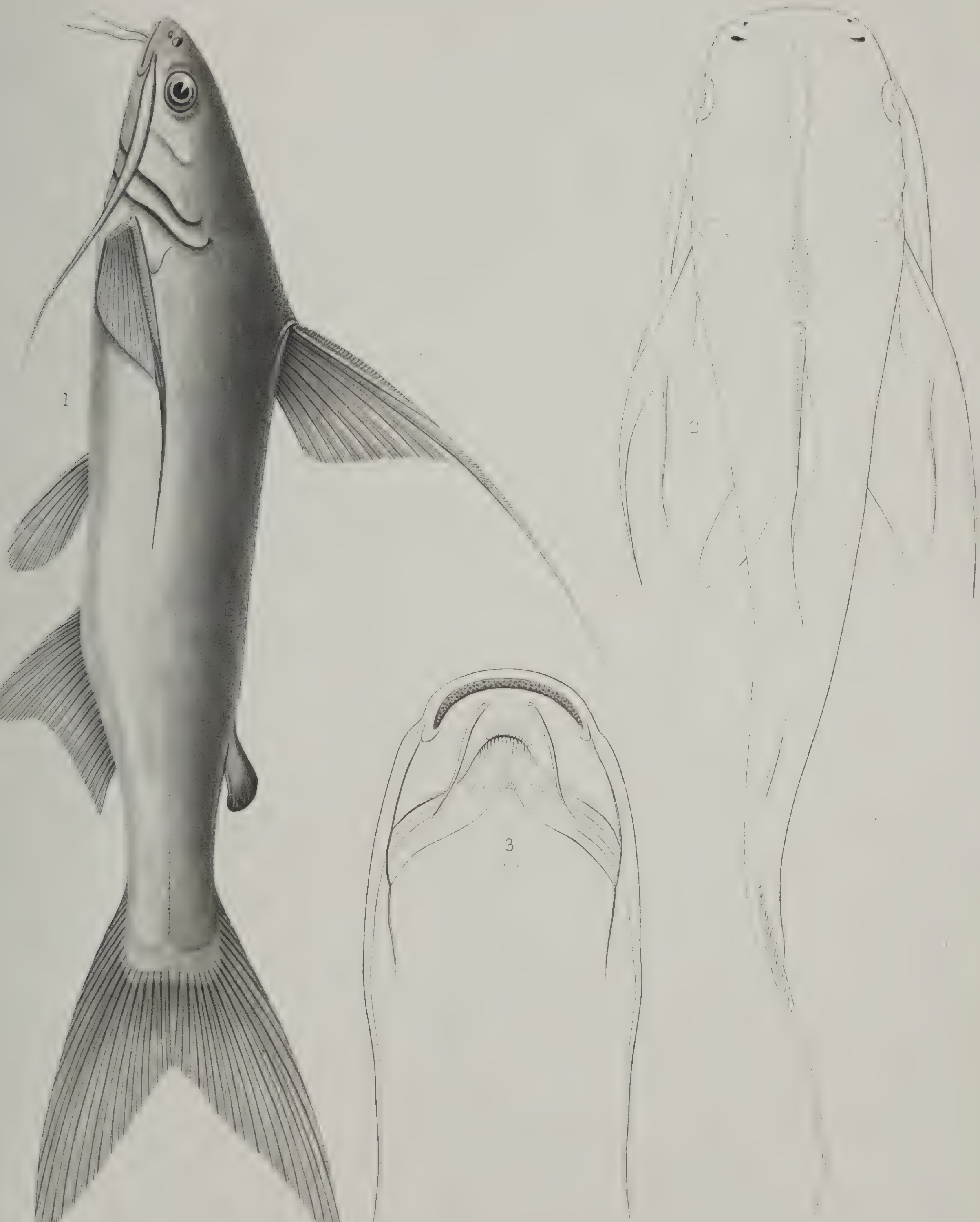

6

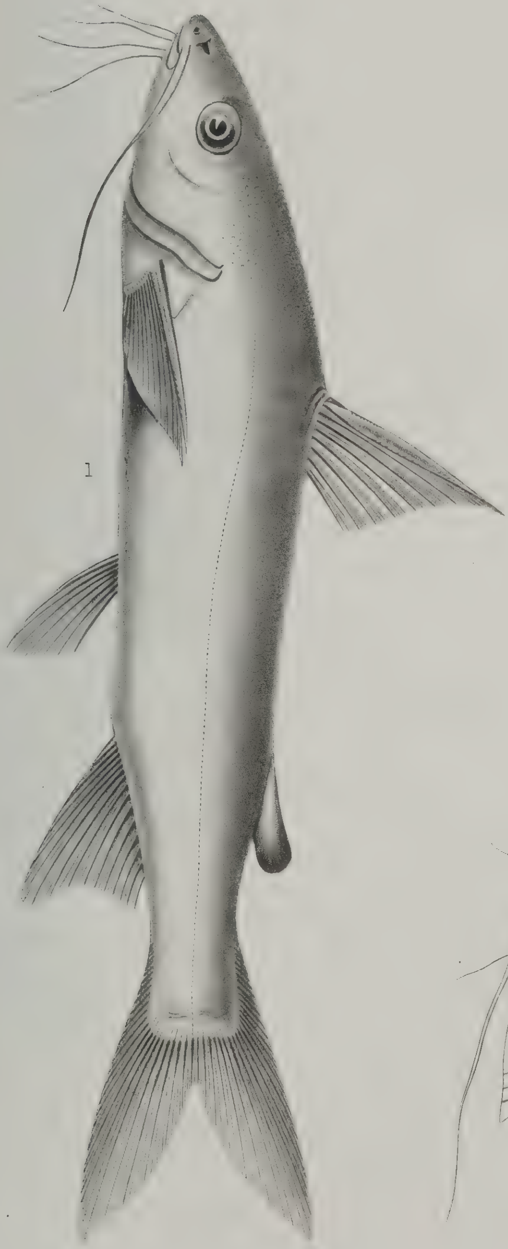

3

J. H. Richard del

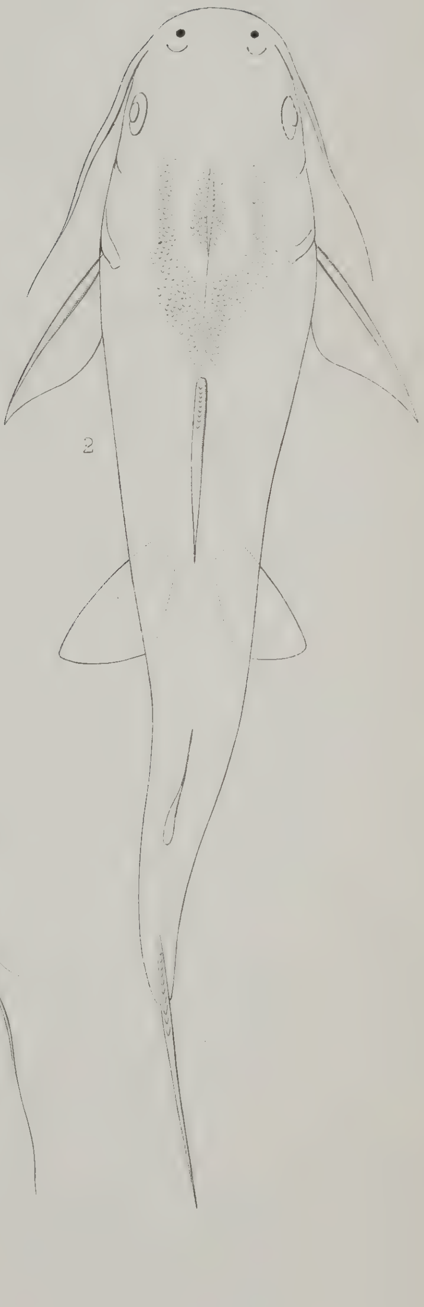
Dougal sc.


2
3
4
1

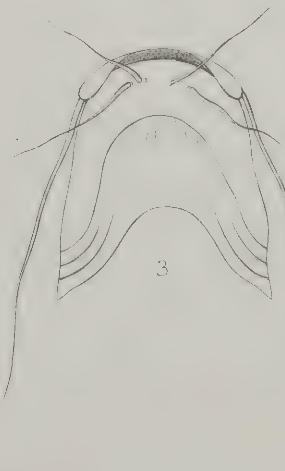

1
2
3



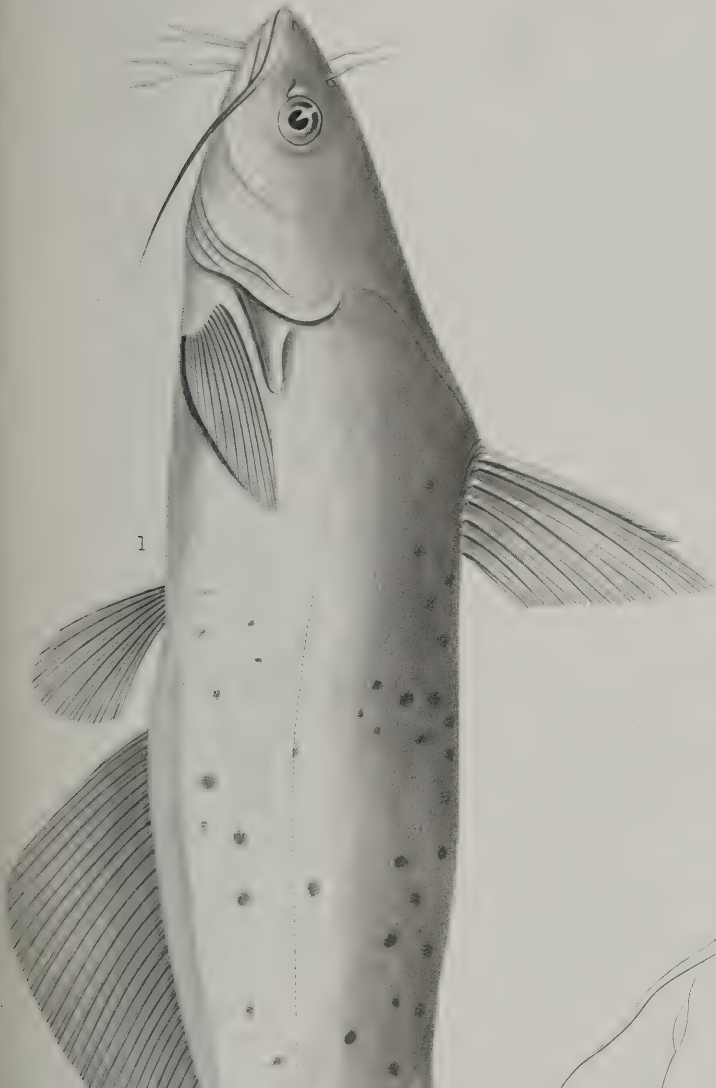
1

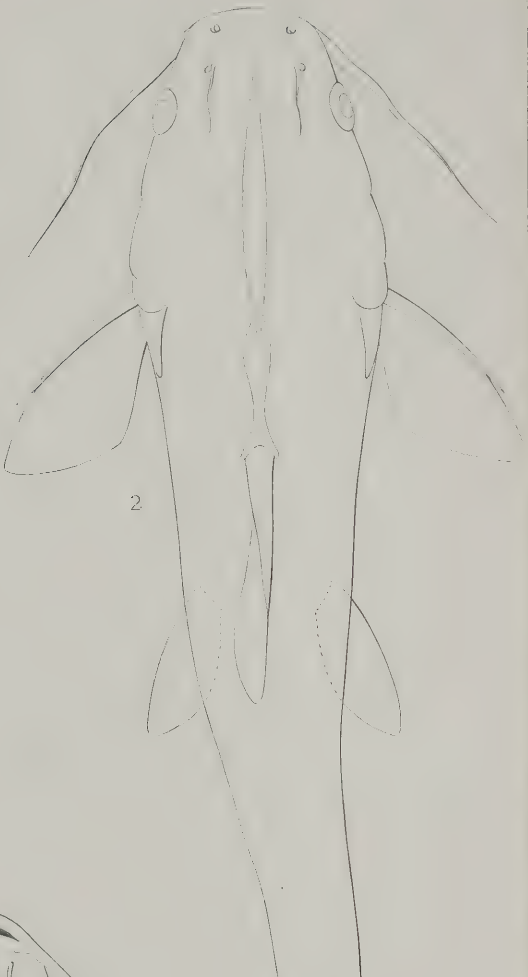


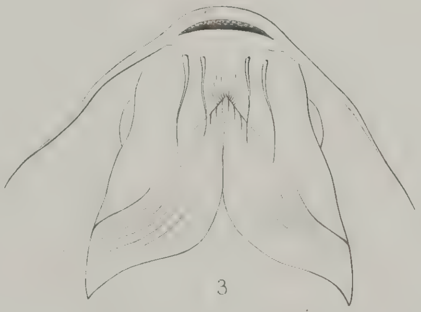
2

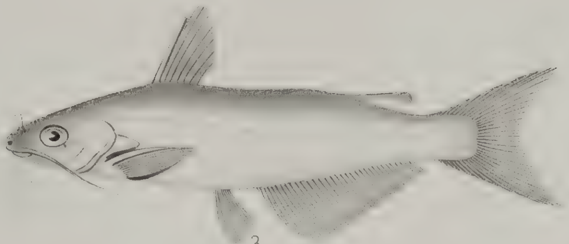


3

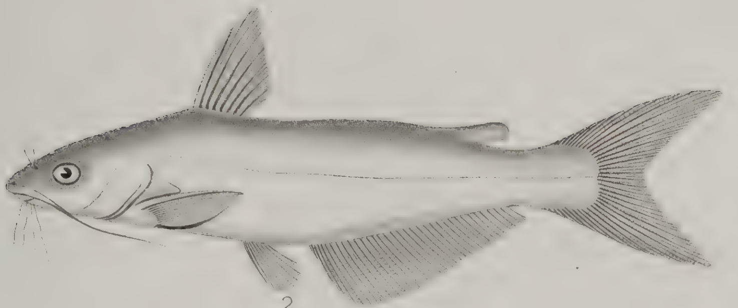

1


2

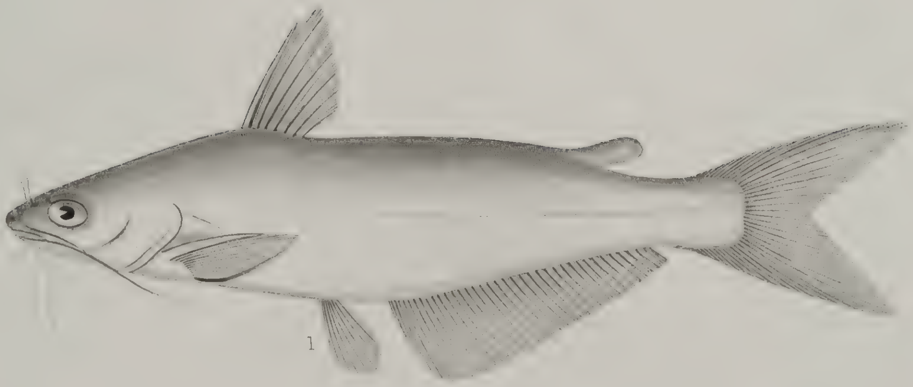

3



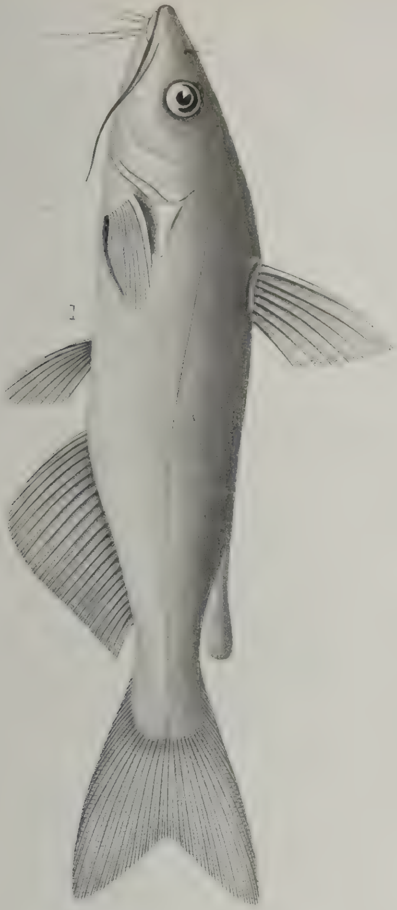
3

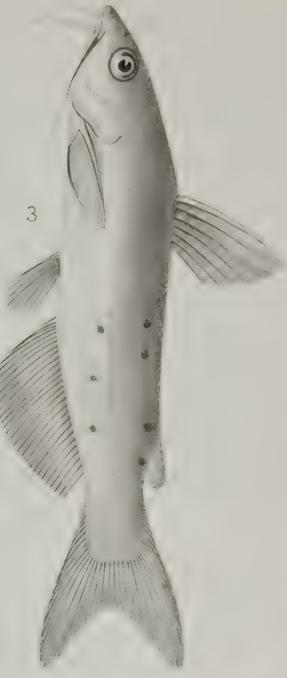


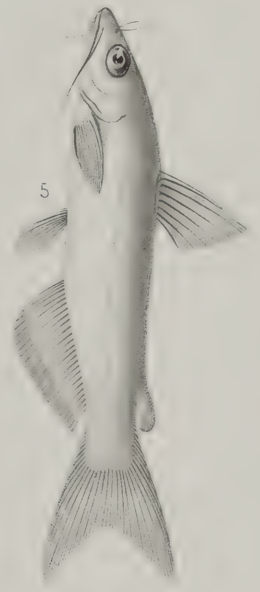
2

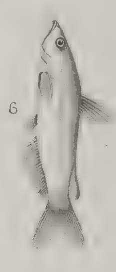


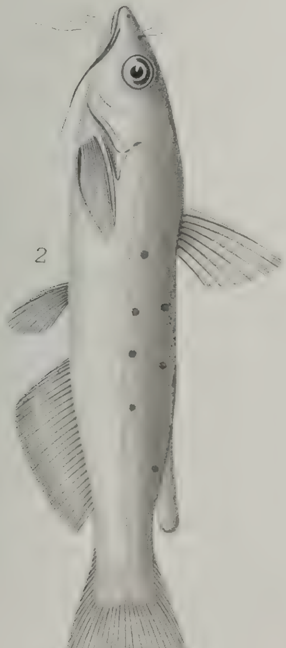
1

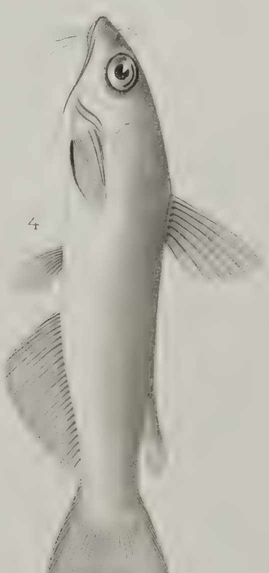

1

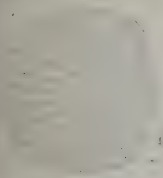

3

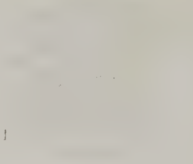

5

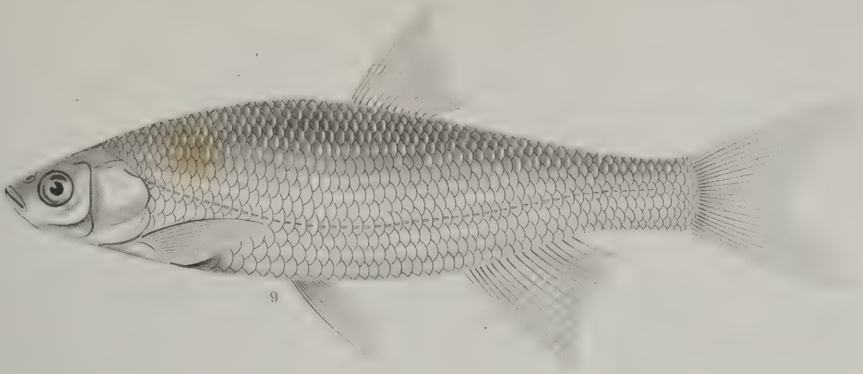

6

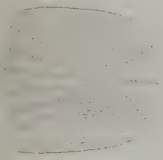

2


4

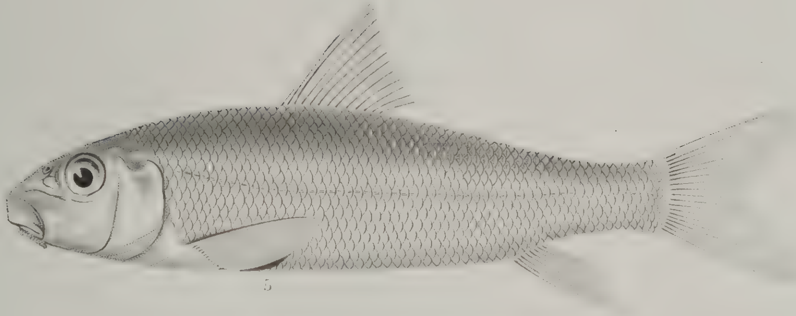

10

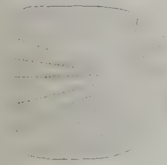

11

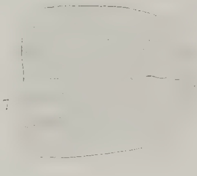

9

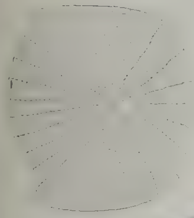

6

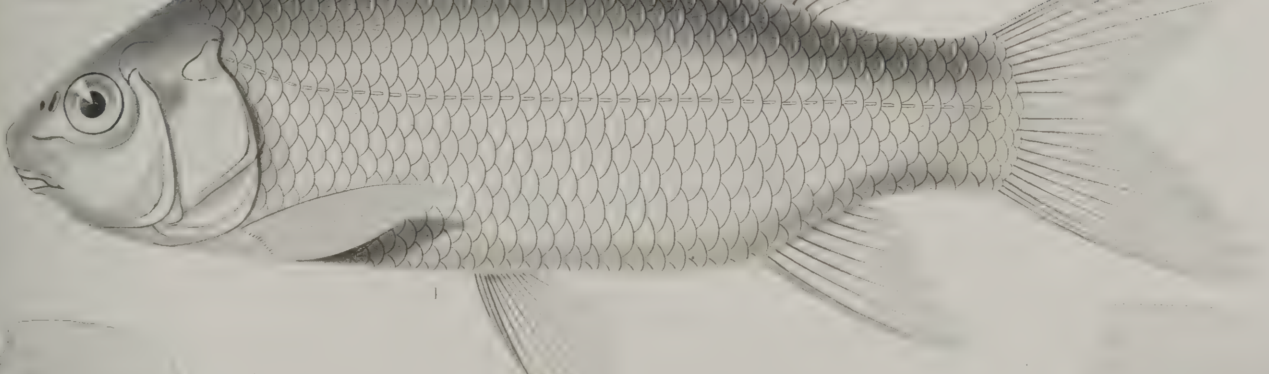
12

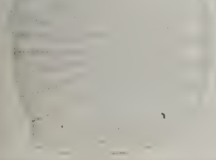

5

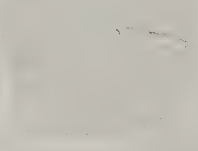

8


7

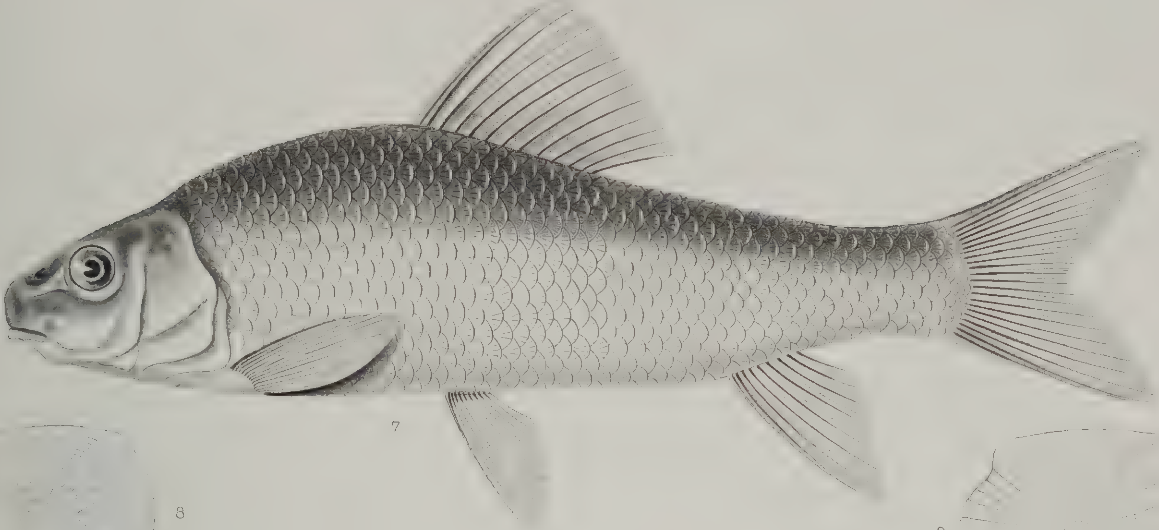

2


1


4

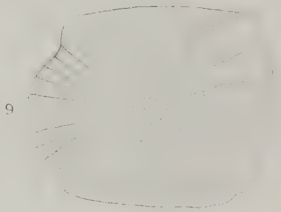

3

J. H. Richard del. Dougal sc.

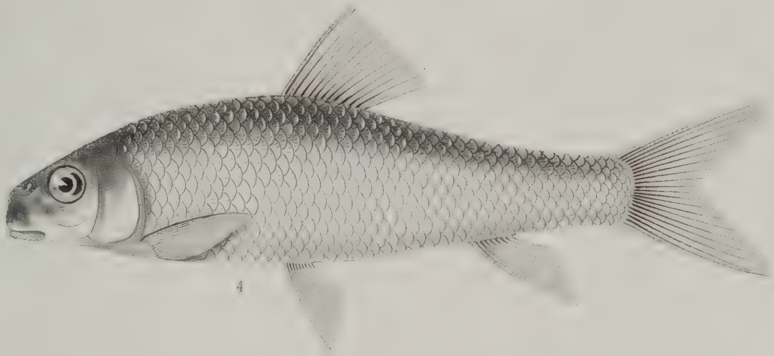


7

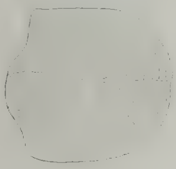
8



9

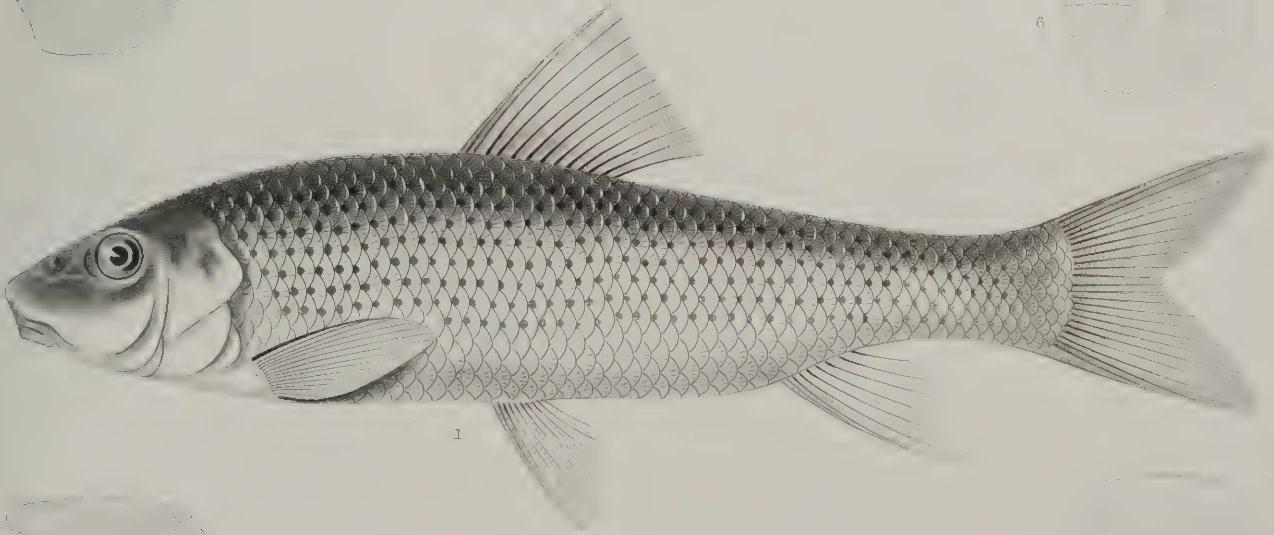


4

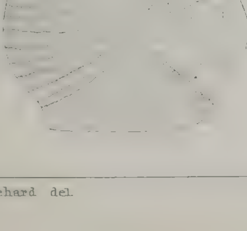


5

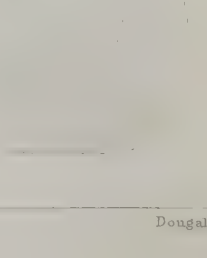
6



1

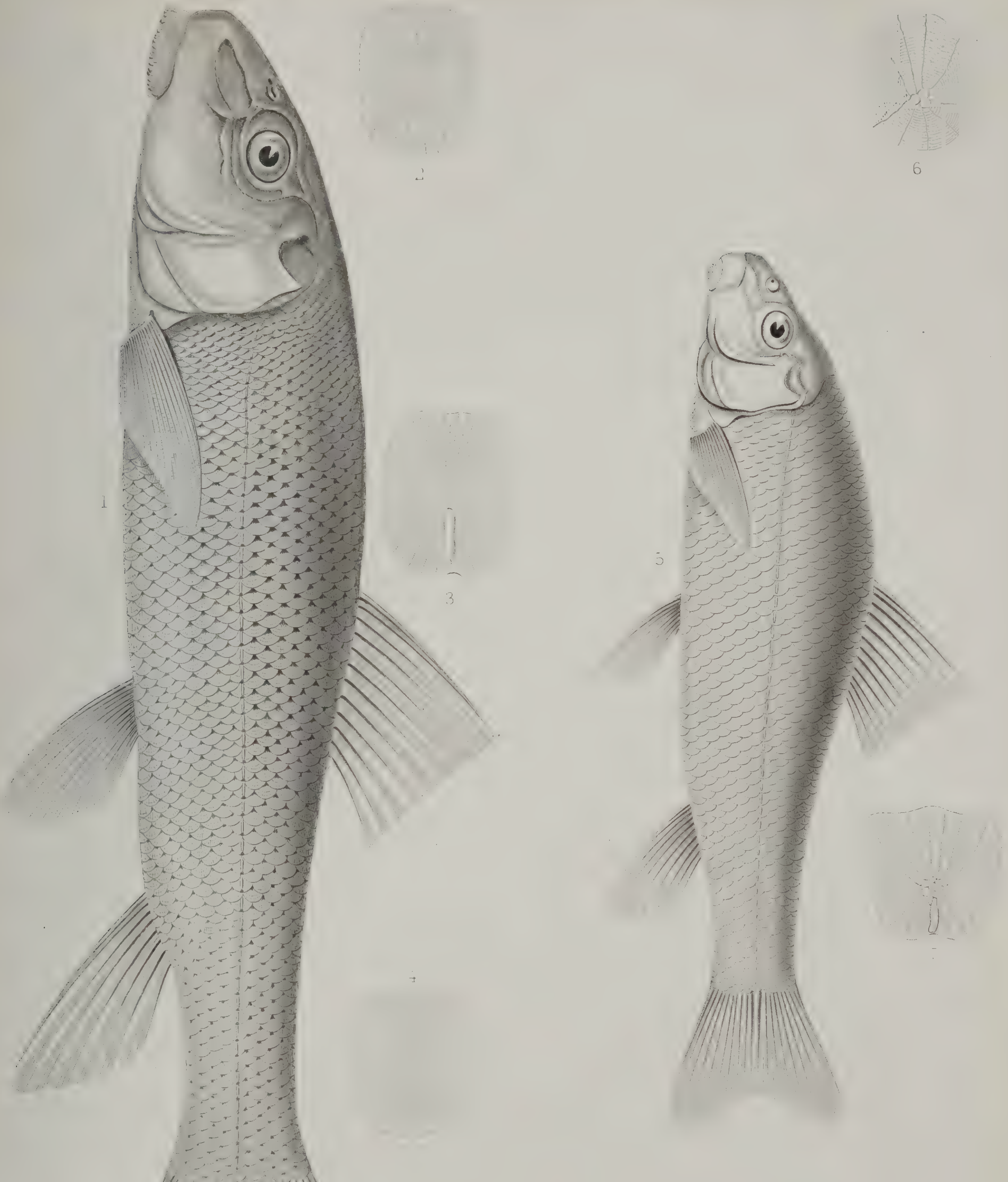


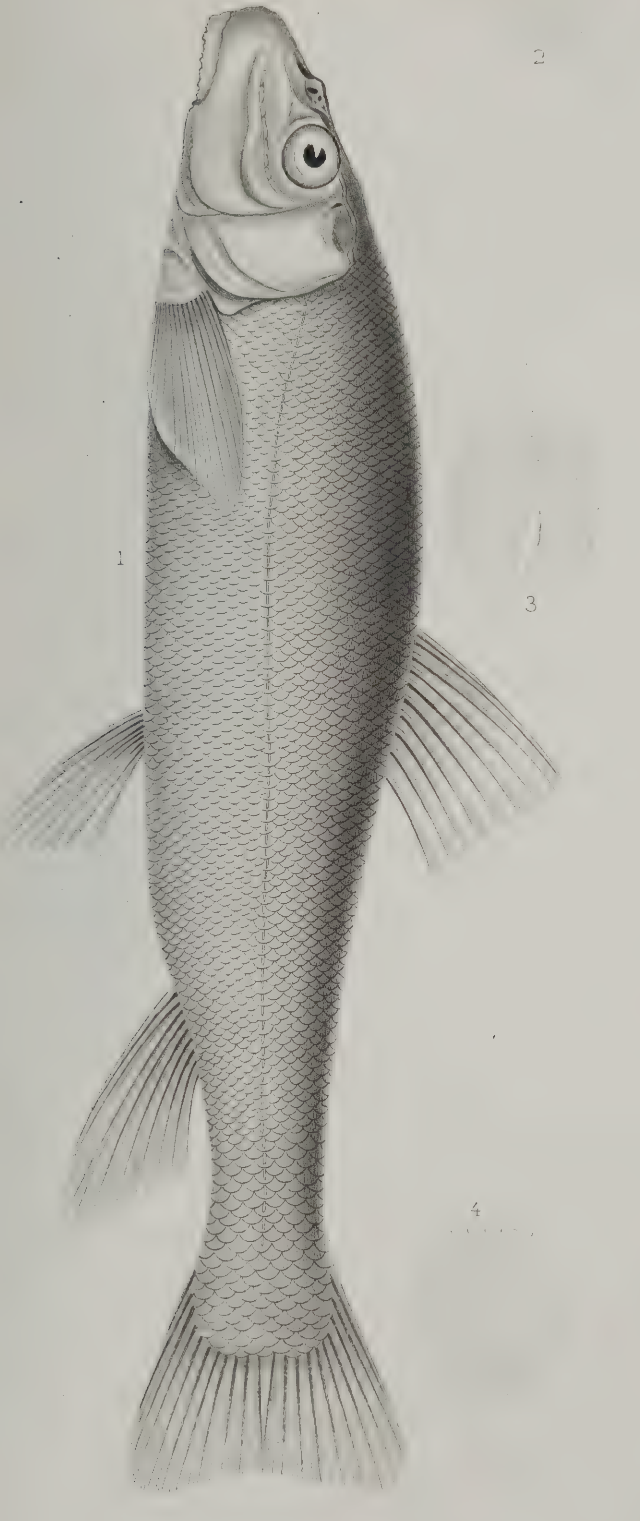
2



3

J.H.Richard del. Dougal sc

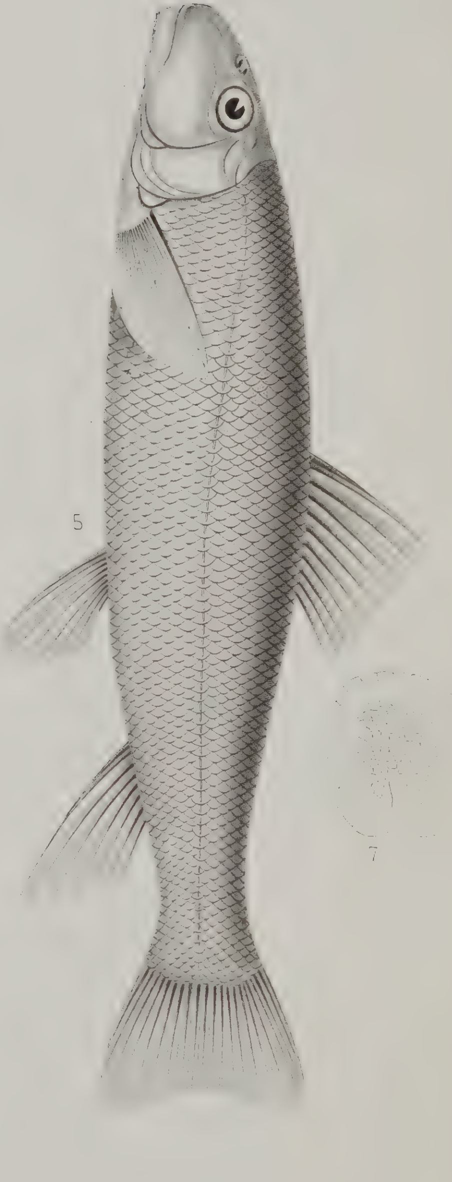

1
2
3
4
5
6
8


1

2

3

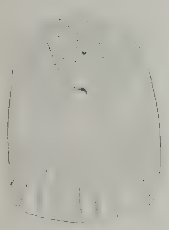
4


5

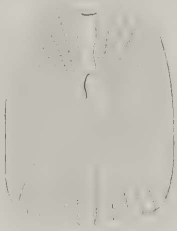
6

7

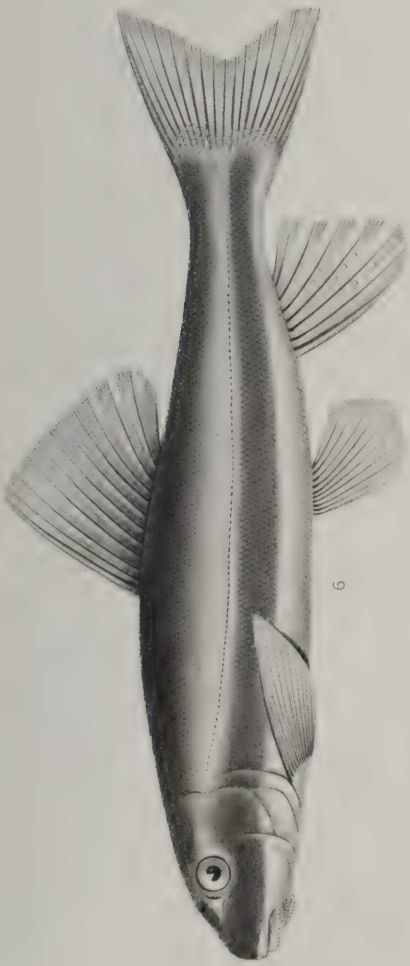
8

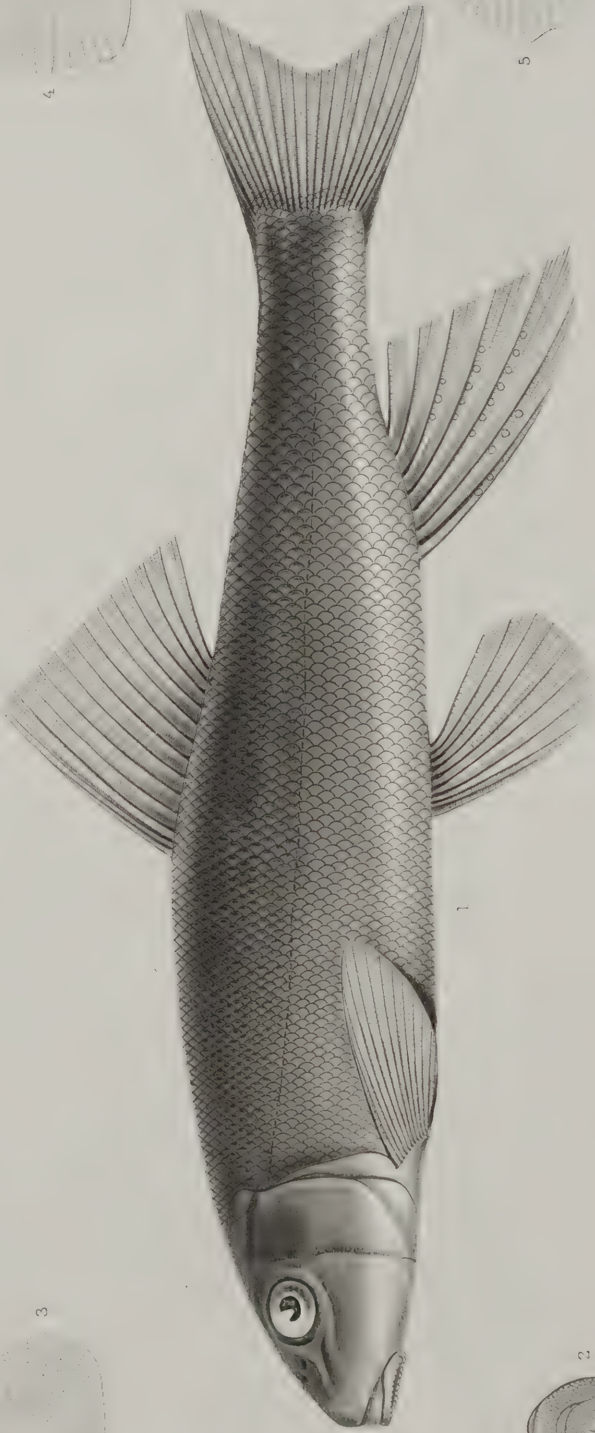

9

10


4

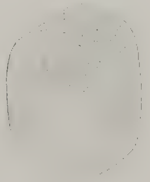
5


6


1

8

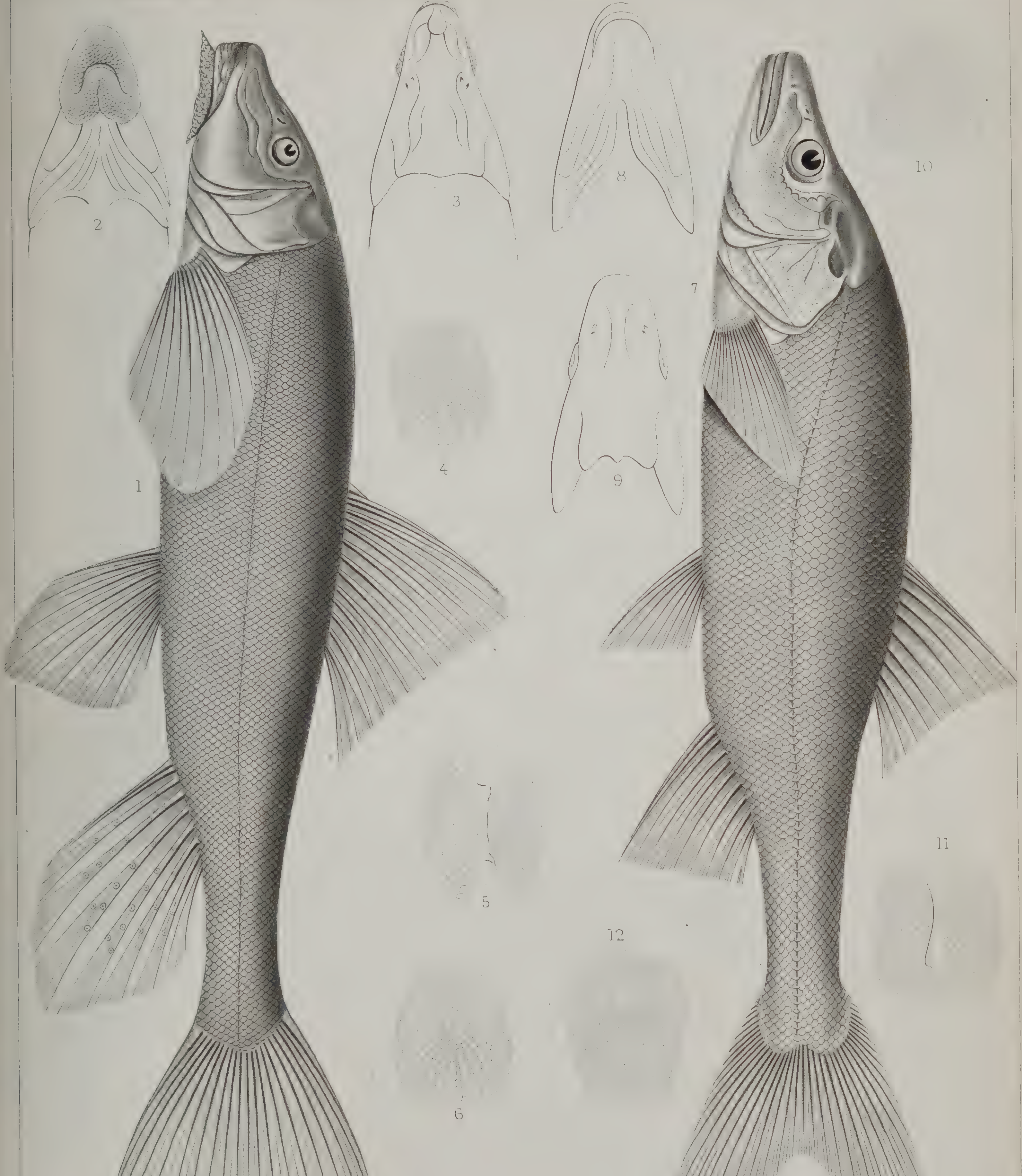
7

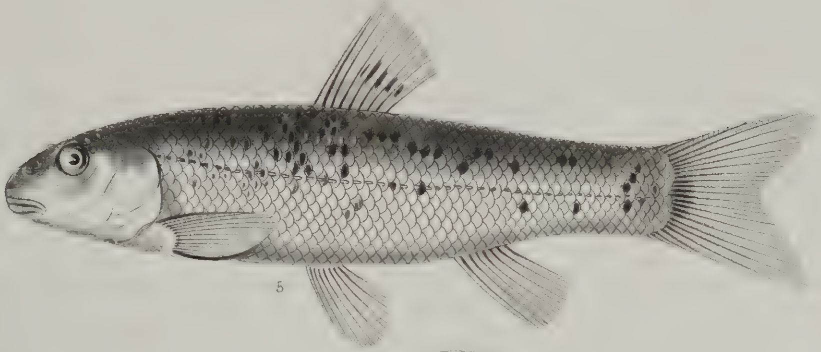

3

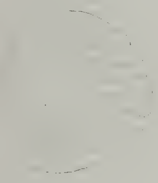
2

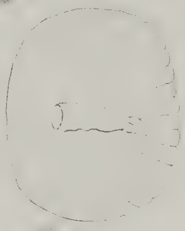
J.H.Richard del

Dougal sc.

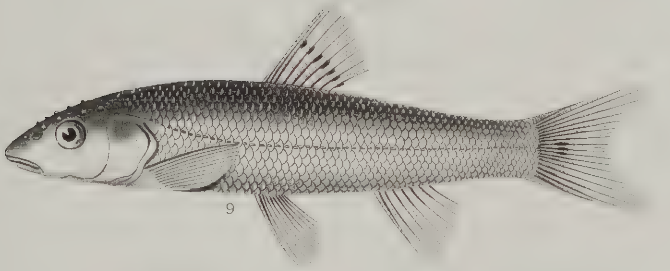

2
3
8
10
1
4
7
9
5
11
12
6


5


6


7

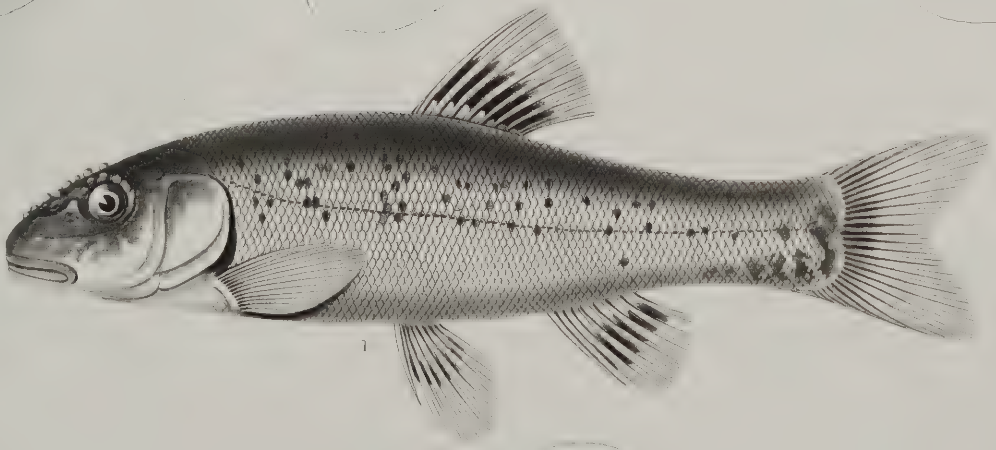
8


9

10

11

12


1

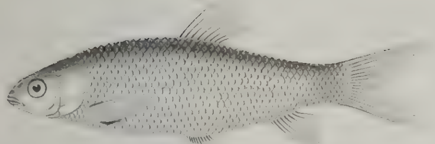
2

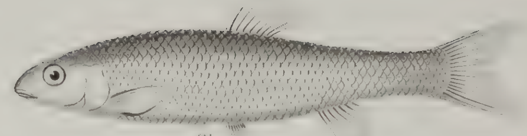
3

4

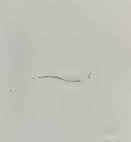
J.H.Richard del

Dougal sc


17

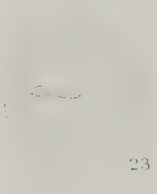

21

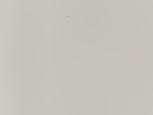
18

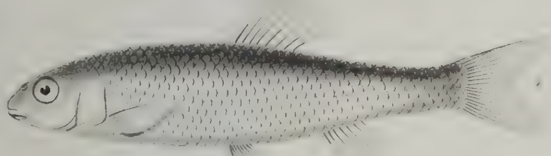

19

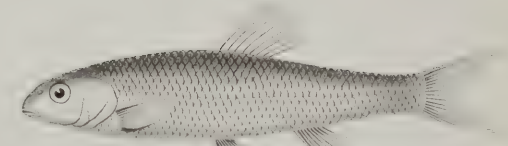
20

22


23

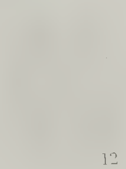

24


9

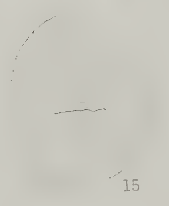

13

10

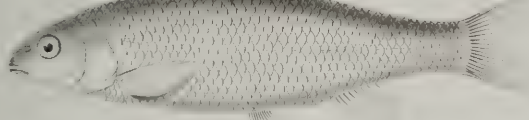
11

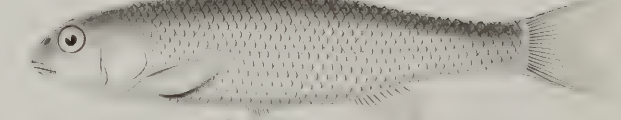

12

14


15

16


1


5

2

3

4

6

7

8

J. H. Richard del.

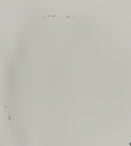
Dougal sc.

13

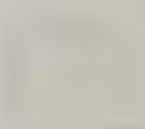
17

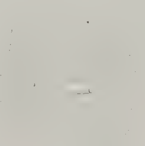
14

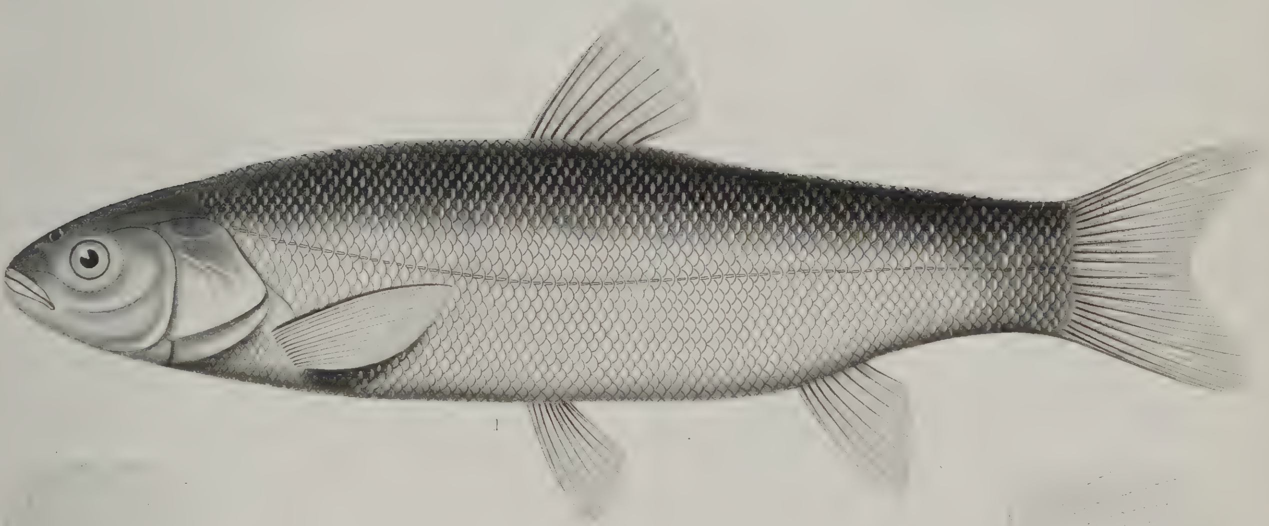
16

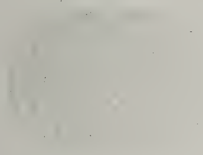

15

18


20

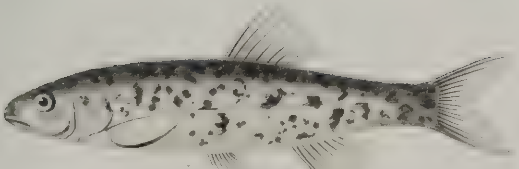

19

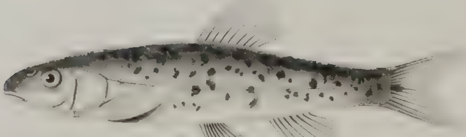

1

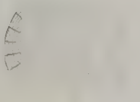

2

4

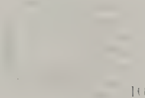
3

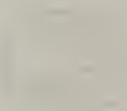

5


9


6

8

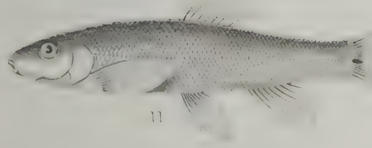

10

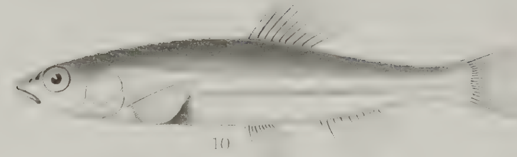

12

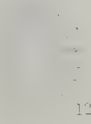
7

11

Dougal sc.

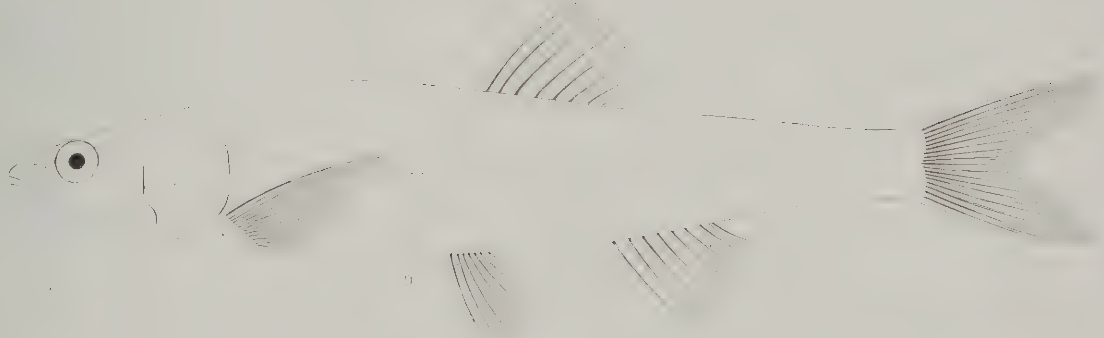

11

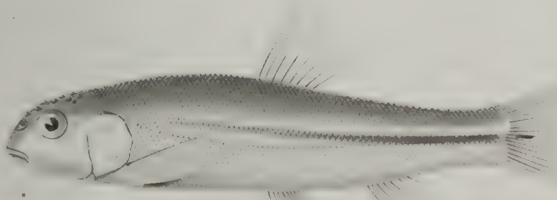

10

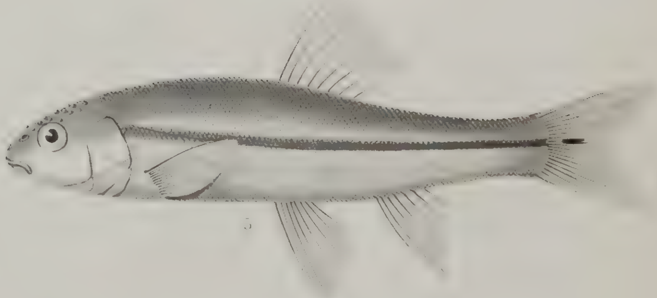

12

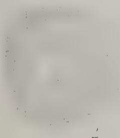
13

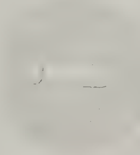
14


9


1

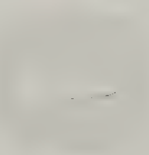

5

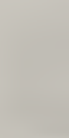

2


3

4

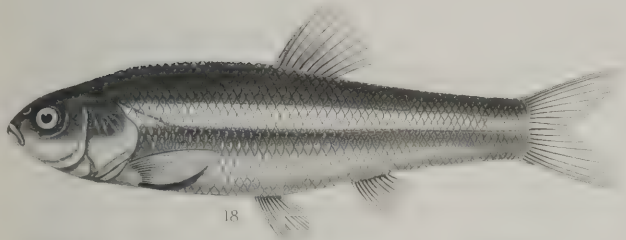
6

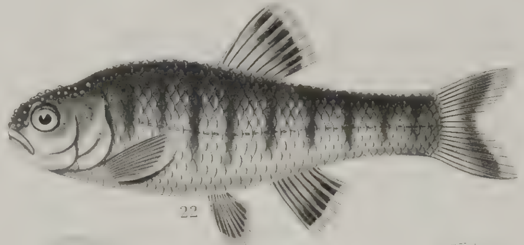

7


8

J. H. Richard del.

Dougal sc.


18


22

19

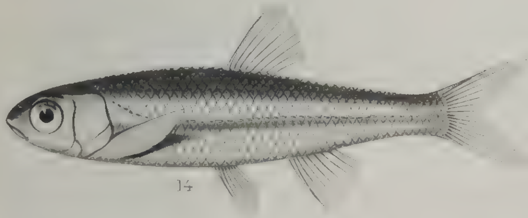
20

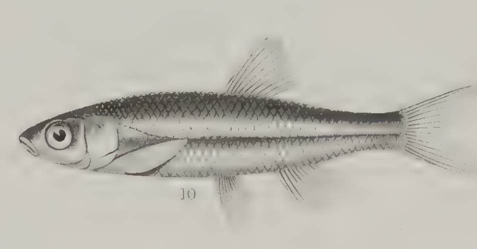
21

23

24

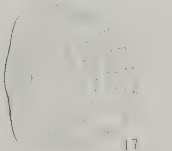
25


14

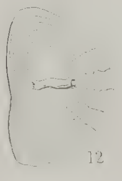

10

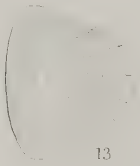
15

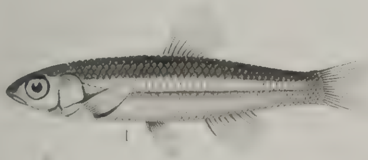
16

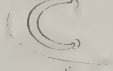

17

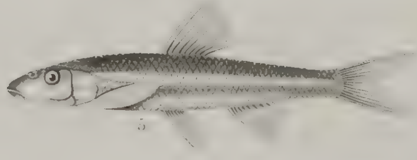
11


12

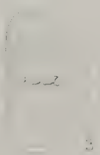

13

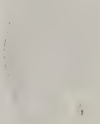

1

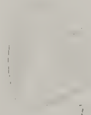

6


5

2


3

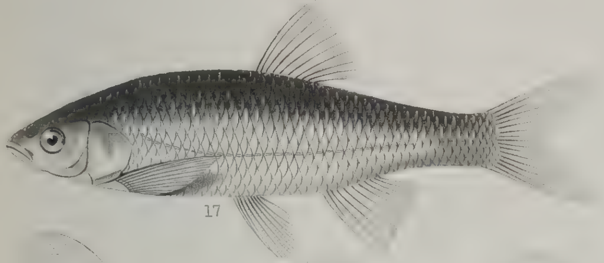

4

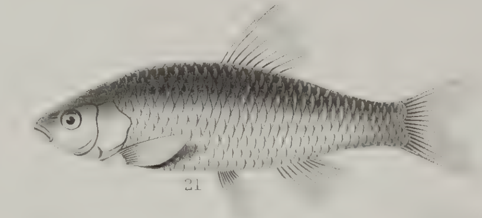

7

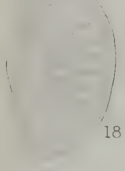
8

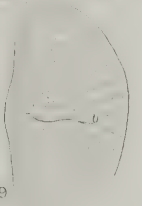
9

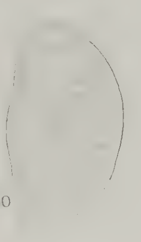
J.H.Richard del Dougal sc.

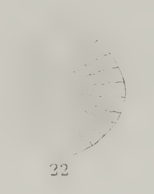

17


21


18

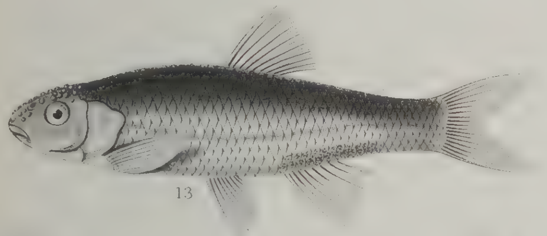

19

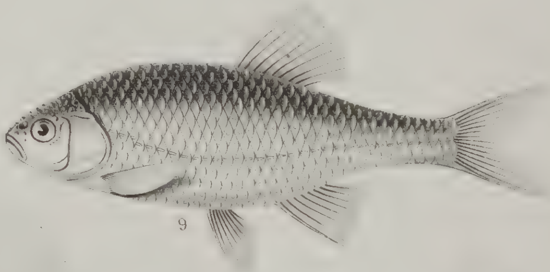

20

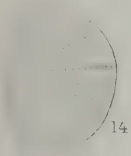

22

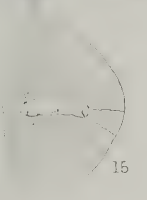
23

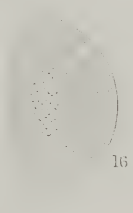
24


13

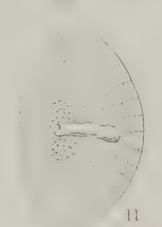

9


14

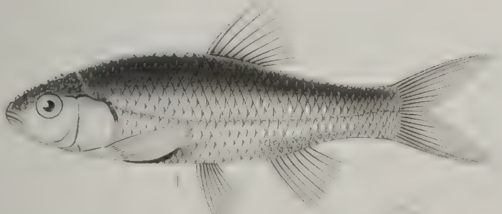

15

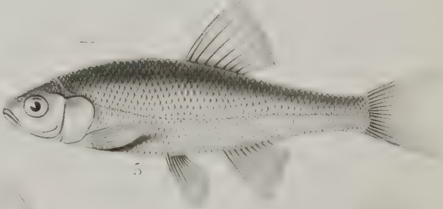

16

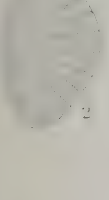
10

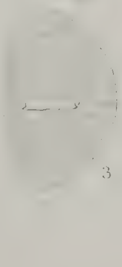

11

12

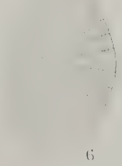

1

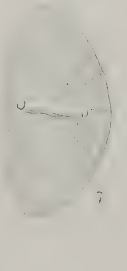

5


2


3

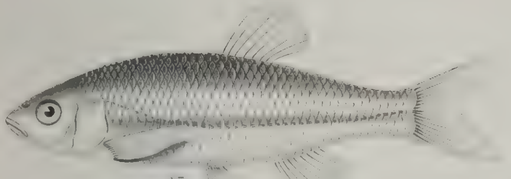
4


6


7

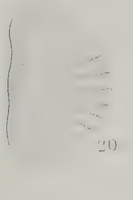
8

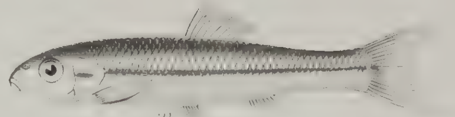
J. H. Richard del. Dougal sc.


17

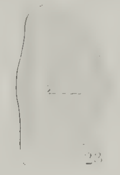
18

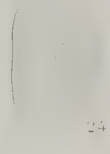
19

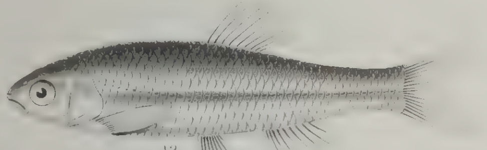

20


21

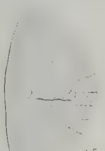
22


23

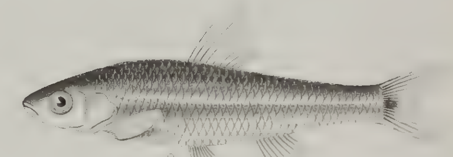

24


13

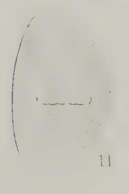
14


15

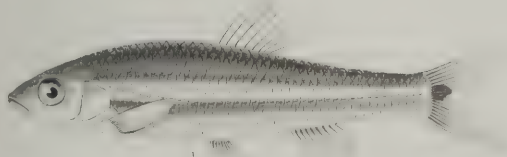
16

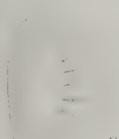

9

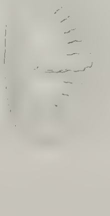
10


11

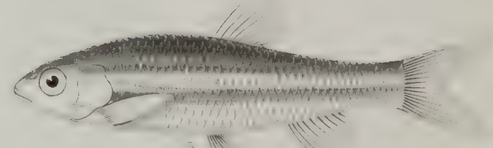
12

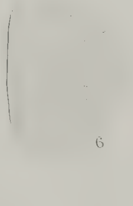

1

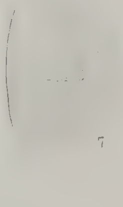

2


3

4

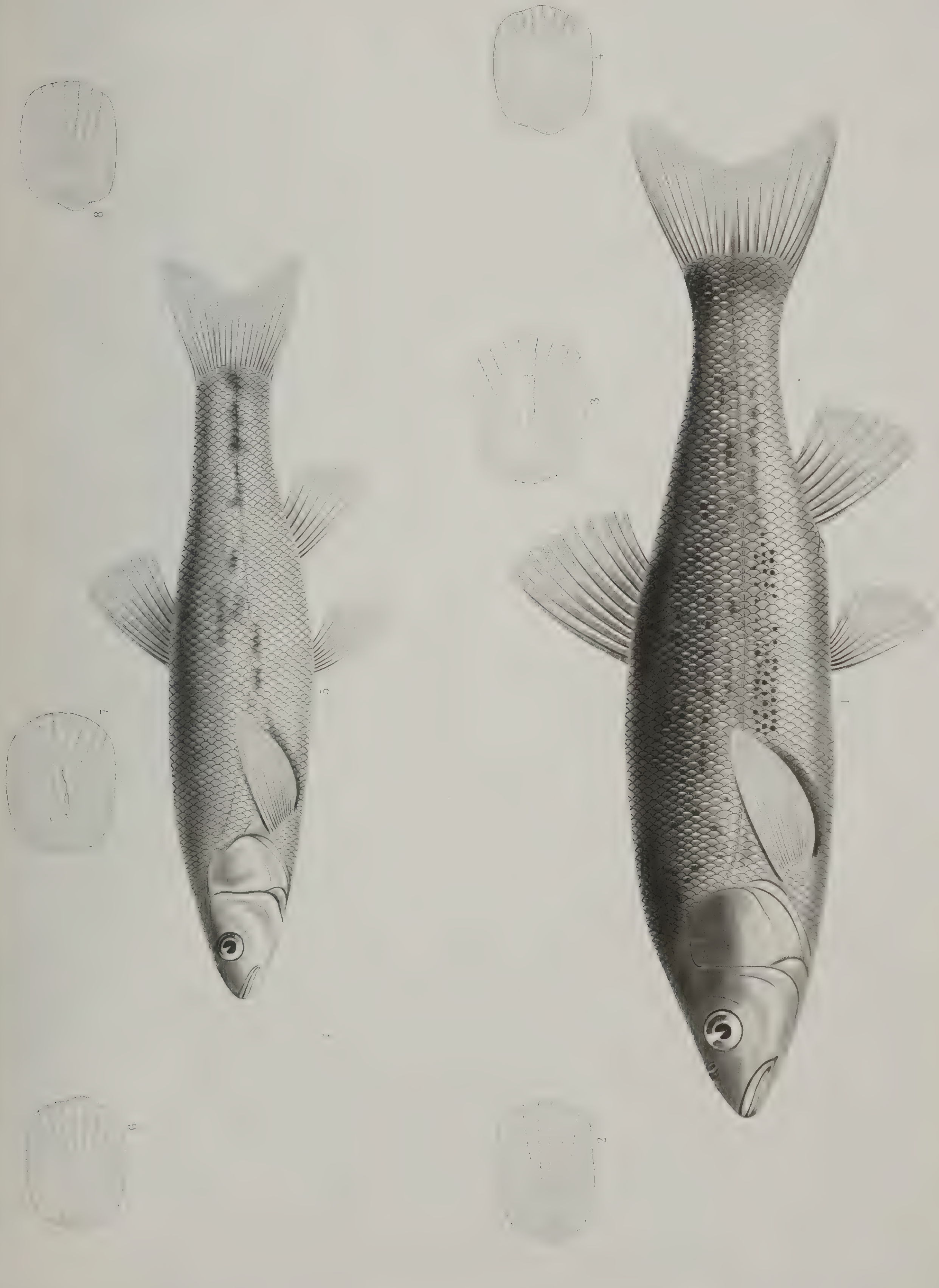

5


6

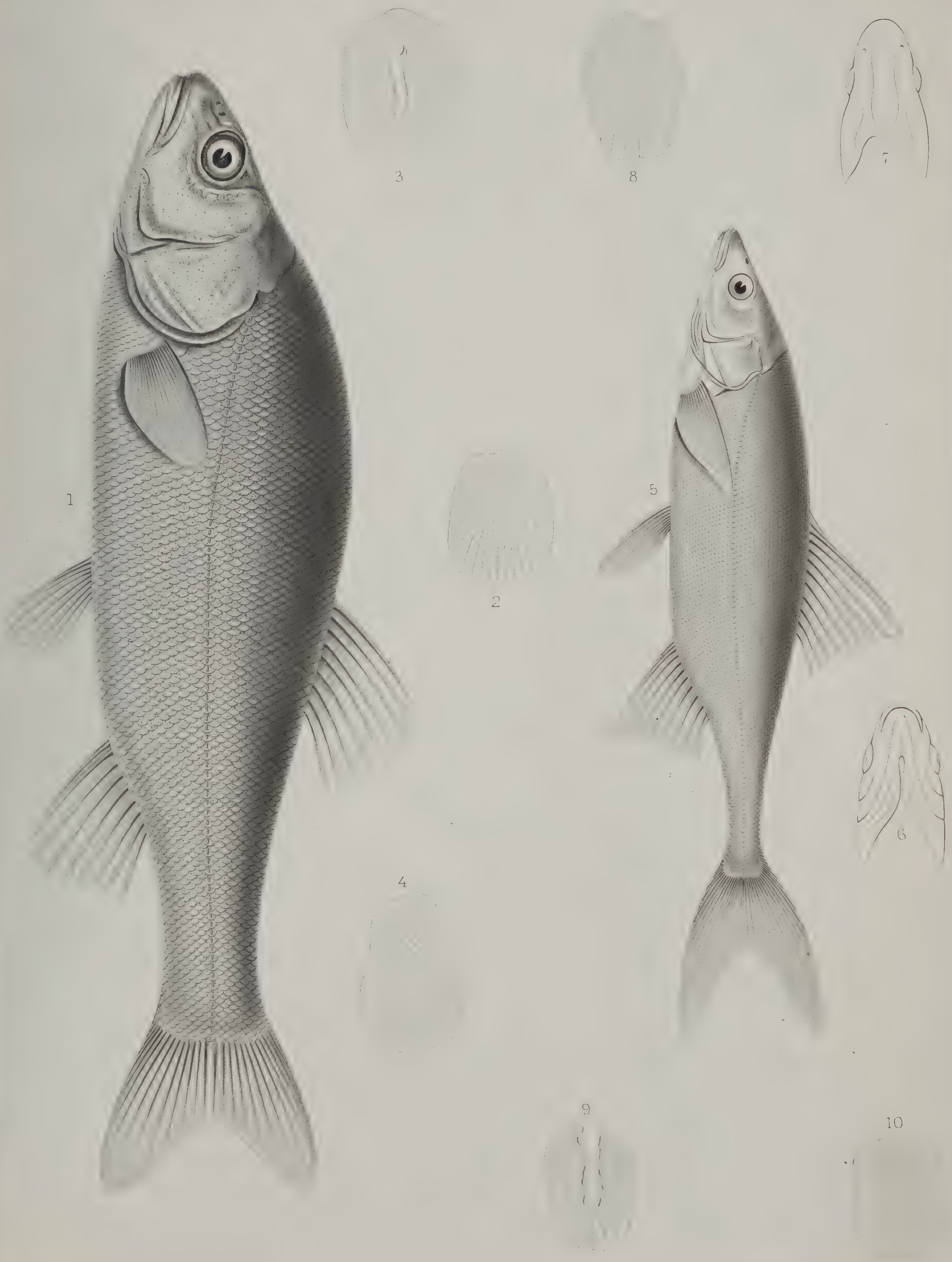

7

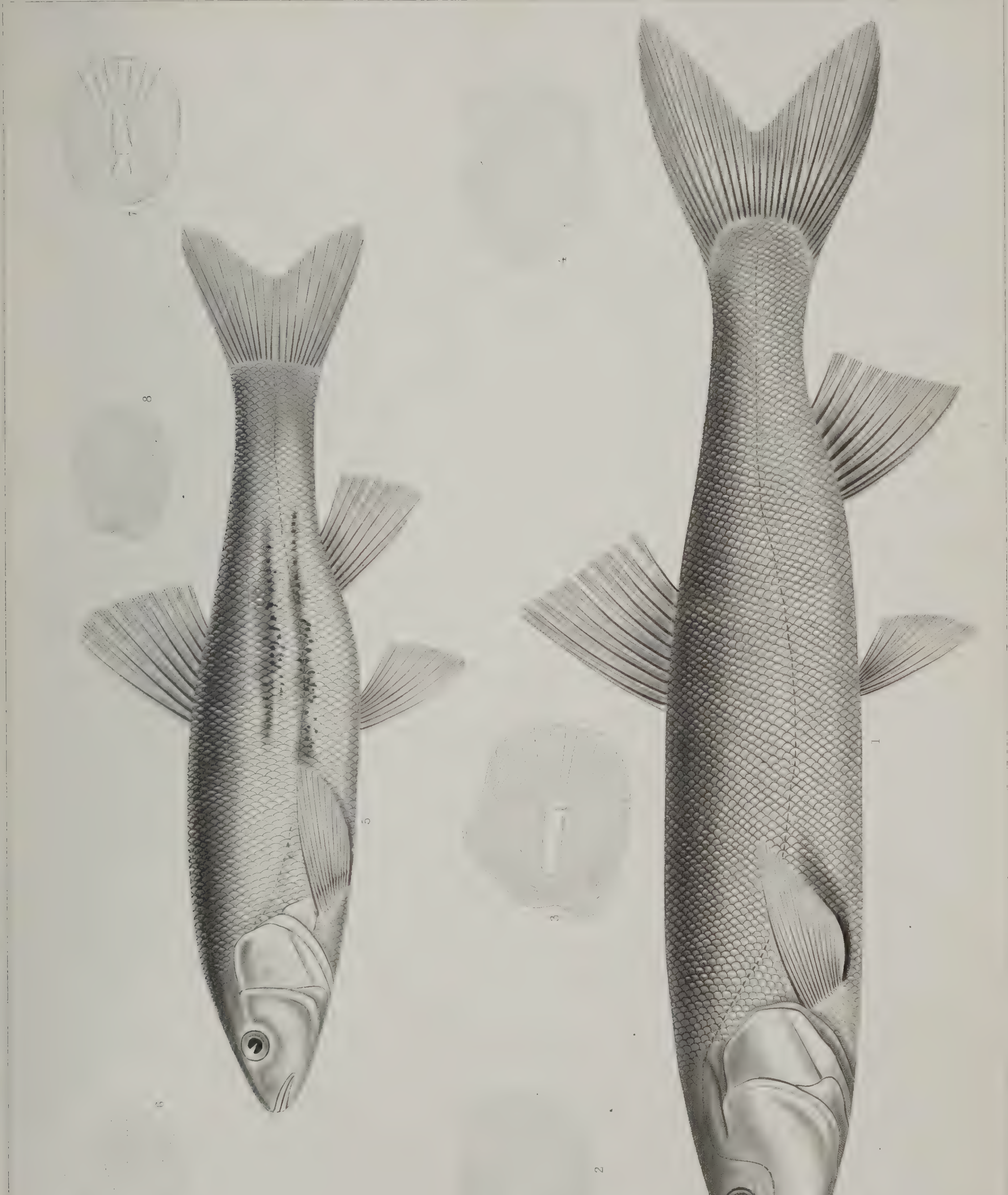
8

J. H. Richard del. Dougal sc.



J H Richard del.
Dougal sc.

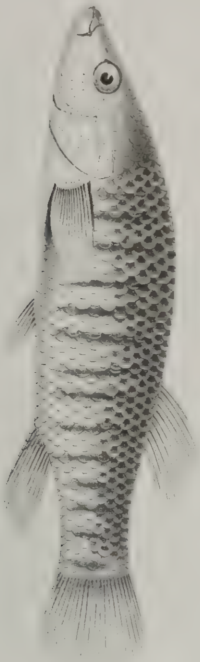

3
8
7
1
5
2
6
4
9
10



J.H. Richard del

Dougal sc.

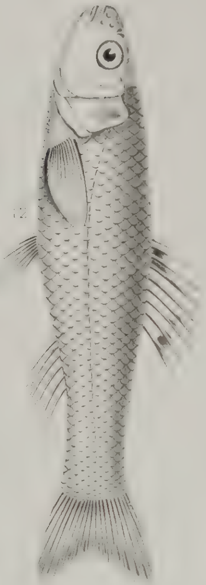
3

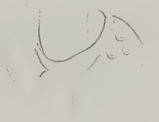


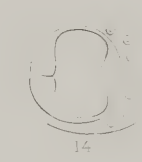
4

15

12



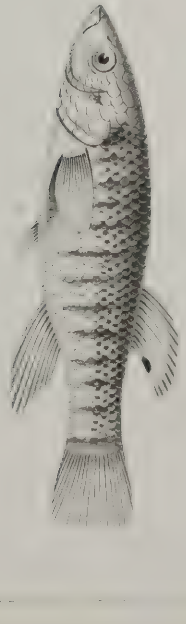




14

7

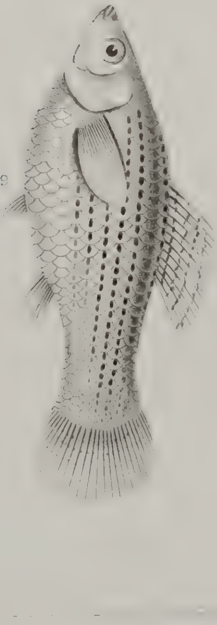
8



6

9

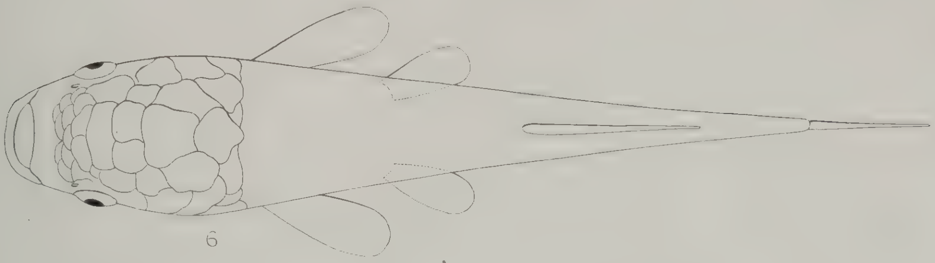
10



11

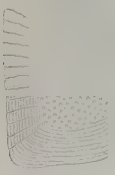
J H. Richard del

W H Dougal Sc.

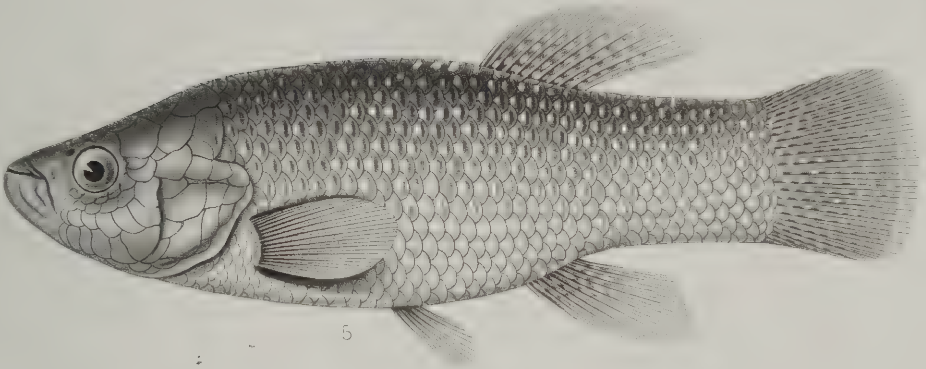


6

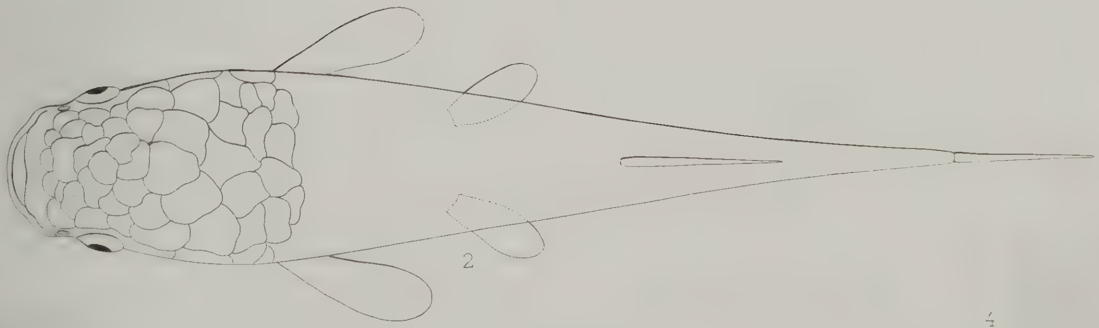
8



7



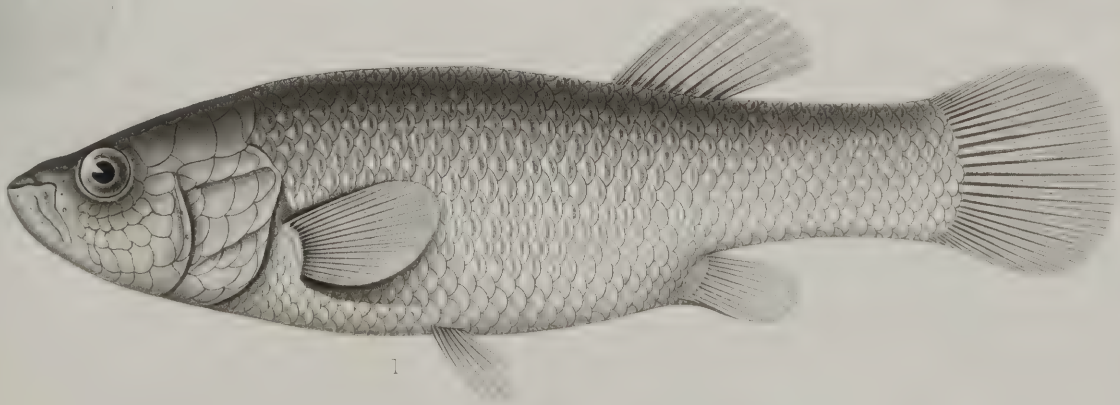
5



2

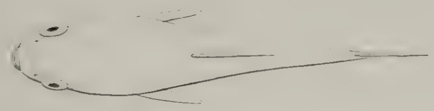
4

3

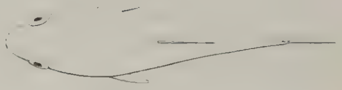


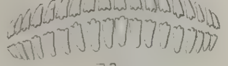
1

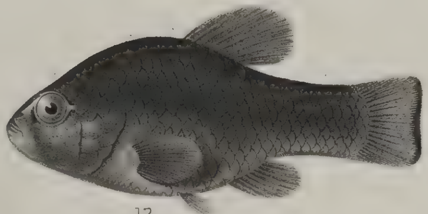
15

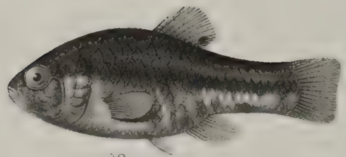

14

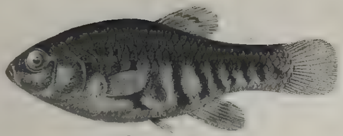
17


16

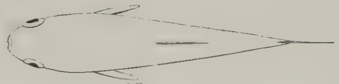

13

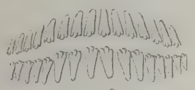

12


18

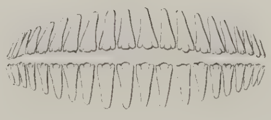

8

11

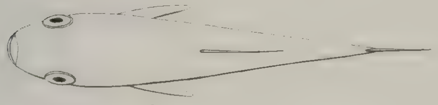

10

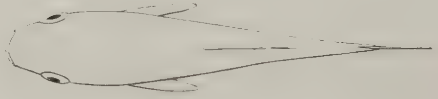

9

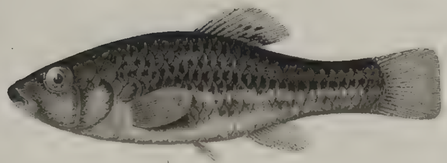
3

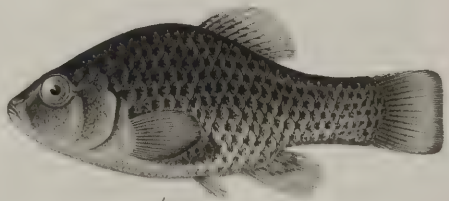

5

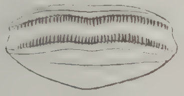
7


2


6


1

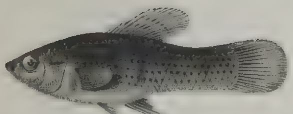

4

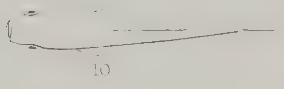

9

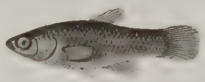
11

14

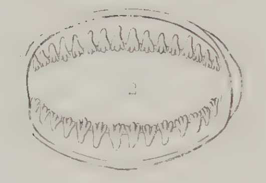
13


8


10


12

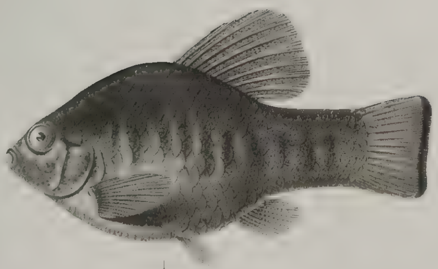
4

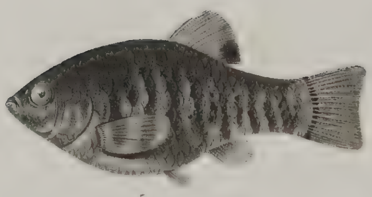

2

7

3

6

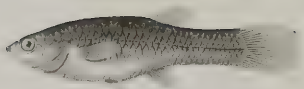

1


5

19

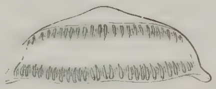
18

17

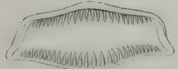

16

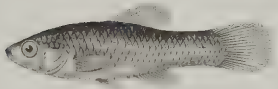
23

22


13

15


21

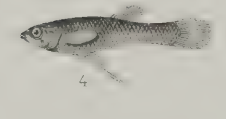

20

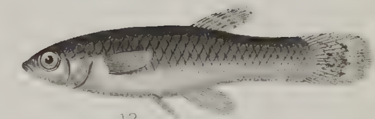
14

7

6

5


4


12

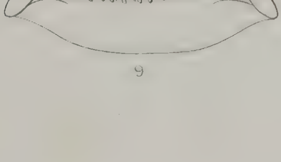
13

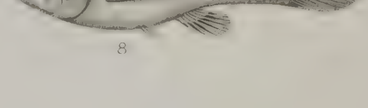
2

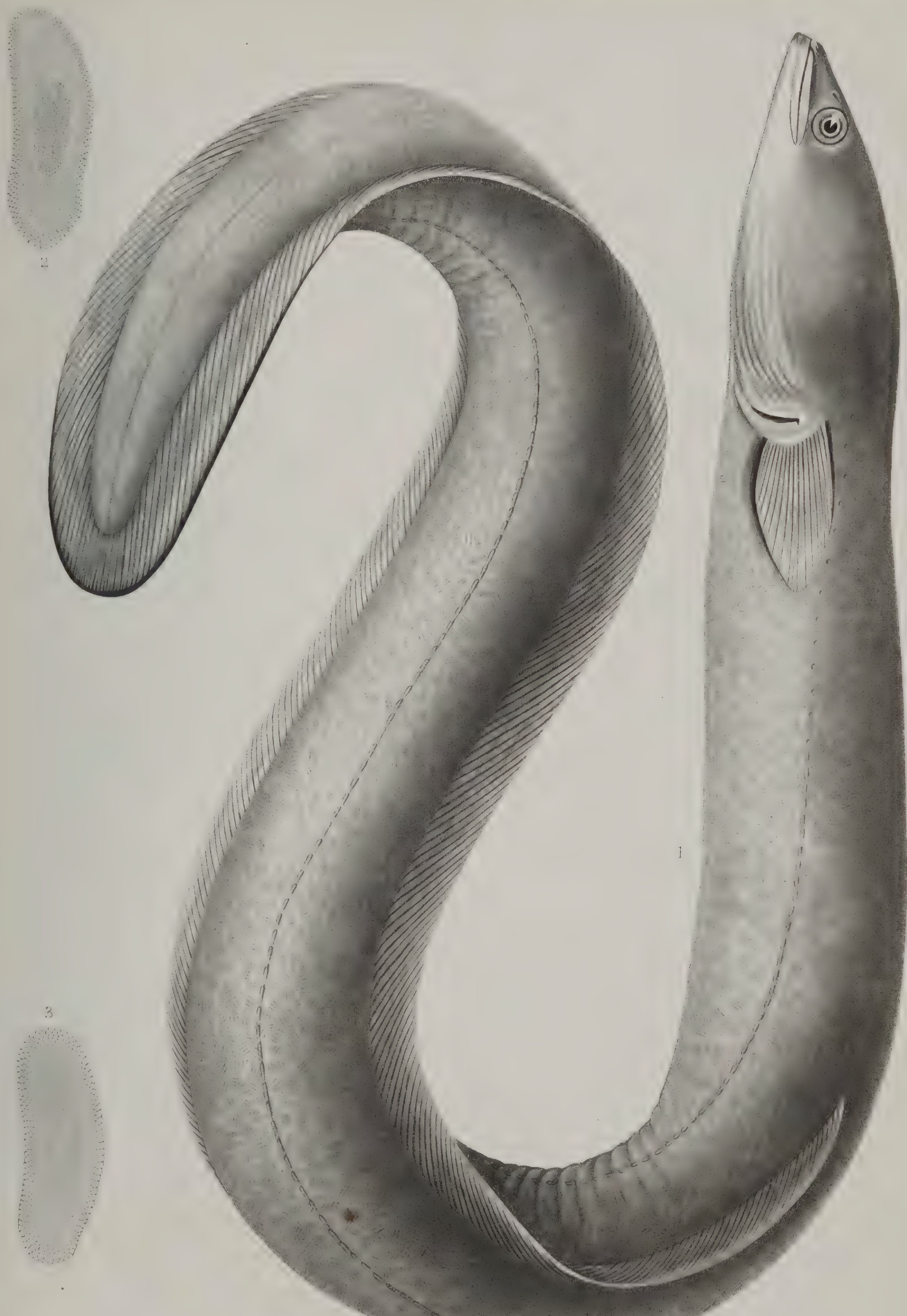
11

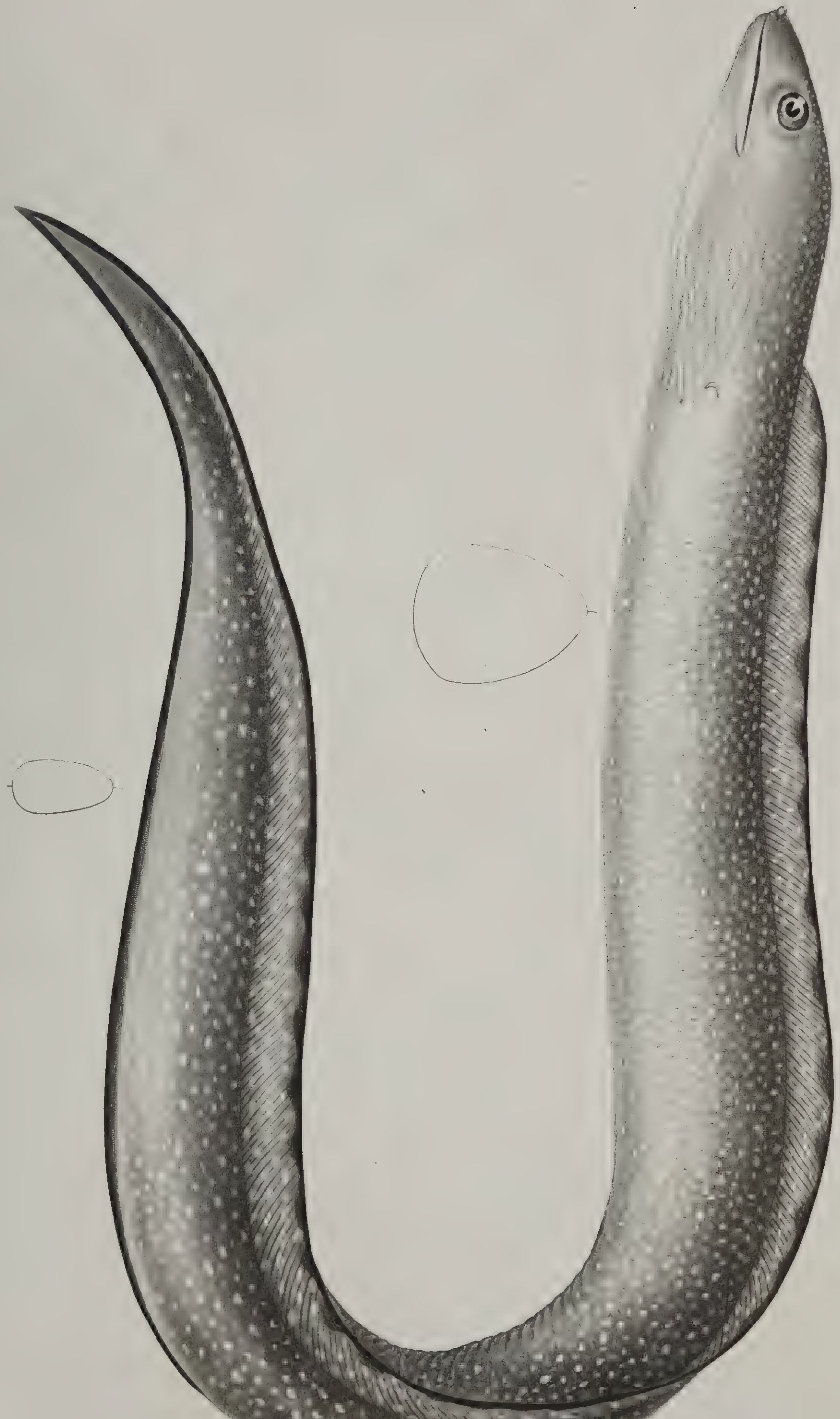
10

1


9


8


2
1
3



2

JUL 25 1929